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COOKE & CO.'S

ILLUSTRATED CATALOGUE

OF GENERAL

MACHINERY AND SUPPLIES

FOR

Machinists, Manufacturers, Mills, Mines, Rail-
roads, Steamships, Etc., Etc.

SPECIAL AGENTS FOR

ROOTS' FORCE BLAST, ROTARY BLOWERS, GAS EXHAUSTERS.
PORTABLE FORGES, TUYERE IRONS, AND
WATER ENGINES.

KINGSFORD FOUNDRY AND MACHINE WORKS' HORIZONTAL
ENGINES, BOILERS AND WATER WHEELS.

GREENFIELD VERTICAL ENGINES AND BOILERS,
WATER'S PERFECT ENGINE GOVERNORS,
KEYSTONE INJECTORS,
STEAM BOILER TUBE CLEANERS,
CHAIN AND ANCHORS, EMERY WHEELS, MACHINE TOOLS,
ETC., ETC.

OFFICE AND WAREROOMS,

22 Cortlandt Street, New York, N. Y.

(OPPOSITE THE COAL AND IRON EXCHANGE.)

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COOKE & CO.,

Machinery and Supplies,

22 CORTLANDT STREET.

To the Mechanical Public:

We have added several new lines and represented most of the latest steam and mechanical appliances of merit, and we trust that the book will be found a convenient volume for reference.

We desire to acknowledge our indebtedness to our friends for their generous remembrances in the past, and to assure them that we shall endeavor, by careful attention to their interests, to merit a continuance of their favors.

Very respectfully,

COOKE & CO.

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WROUGHT IRON PIPE.

FOR STEAM, GAS AND WATER.

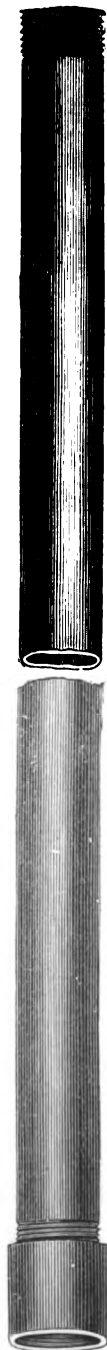


Fig. 1.

PLAIN, GALVANIZED, ENAMELED AND RUBBER COATED.

1½ inch and below, butt welded; proved to 300 lbs. per square inch, hydraulic pressure.

1½ inch and above, lap-welded; proved to 500 lbs. per square inch, hydraulic pressure.

Internal Diameter..	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{7}{8}$	3	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$3\frac{3}{4}$	$3\frac{7}{8}$	4	$4\frac{1}{8}$	$4\frac{1}{4}$	$4\frac{3}{8}$	$4\frac{1}{2}$	$4\frac{5}{8}$	$4\frac{3}{4}$	$4\frac{7}{8}$	5	$5\frac{1}{8}$	$5\frac{1}{4}$	$5\frac{3}{8}$	$5\frac{1}{2}$	$5\frac{5}{8}$	$5\frac{3}{4}$	$5\frac{7}{8}$	6	$6\frac{1}{8}$	$6\frac{1}{4}$	$6\frac{3}{8}$	$6\frac{1}{2}$	$6\frac{5}{8}$	$6\frac{3}{4}$	$6\frac{7}{8}$	7	$7\frac{1}{8}$	$7\frac{1}{4}$	$7\frac{3}{8}$	$7\frac{1}{2}$	$7\frac{5}{8}$	$7\frac{3}{4}$	$7\frac{7}{8}$	8	$8\frac{1}{8}$	$8\frac{1}{4}$	$8\frac{3}{8}$	$8\frac{1}{2}$	$8\frac{5}{8}$	$8\frac{3}{4}$	$8\frac{7}{8}$	9	$9\frac{1}{8}$	$9\frac{1}{4}$	$9\frac{3}{8}$	$9\frac{1}{2}$	$9\frac{5}{8}$	$9\frac{3}{4}$	$9\frac{7}{8}$	10	$10\frac{1}{8}$	$10\frac{1}{4}$	$10\frac{3}{8}$	$10\frac{1}{2}$	$10\frac{5}{8}$	$10\frac{3}{4}$	$10\frac{7}{8}$	11	$11\frac{1}{8}$	$11\frac{1}{4}$	$11\frac{3}{8}$	$11\frac{1}{2}$	$11\frac{5}{8}$	$11\frac{3}{4}$	$11\frac{7}{8}$	12	$12\frac{1}{8}$	$12\frac{1}{4}$	$12\frac{3}{8}$	$12\frac{1}{2}$	$12\frac{5}{8}$	$12\frac{3}{4}$	$12\frac{7}{8}$	13	$13\frac{1}{8}$	$13\frac{1}{4}$	$13\frac{3}{8}$	$13\frac{1}{2}$	$13\frac{5}{8}$	$13\frac{3}{4}$	$13\frac{7}{8}$	14	$14\frac{1}{8}$	$14\frac{1}{4}$	$14\frac{3}{8}$	$14\frac{1}{2}$	$14\frac{5}{8}$	$14\frac{3}{4}$	$14\frac{7}{8}$	15	$15\frac{1}{8}$	$15\frac{1}{4}$	$15\frac{3}{8}$	$15\frac{1}{2}$	$15\frac{5}{8}$	$15\frac{3}{4}$	$15\frac{7}{8}$	16	$16\frac{1}{8}$	$16\frac{1}{4}$	$16\frac{3}{8}$	$16\frac{1}{2}$	$16\frac{5}{8}$	$16\frac{3}{4}$	$16\frac{7}{8}$	17	$17\frac{1}{8}$	$17\frac{1}{4}$	$17\frac{3}{8}$	$17\frac{1}{2}$	$17\frac{5}{8}$	$17\frac{3}{4}$	$17\frac{7}{8}$	18	$18\frac{1}{8}$	$18\frac{1}{4}$	$18\frac{3}{8}$	$18\frac{1}{2}$	$18\frac{5}{8}$	$18\frac{3}{4}$	$18\frac{7}{8}$	19	$19\frac{1}{8}$	$19\frac{1}{4}$	$19\frac{3}{8}$	$19\frac{1}{2}$	$19\frac{5}{8}$	$19\frac{3}{4}$	$19\frac{7}{8}$	20	$20\frac{1}{8}$	$20\frac{1}{4}$	$20\frac{3}{8}$	$20\frac{1}{2}$	$20\frac{5}{8}$	$20\frac{3}{4}$	$20\frac{7}{8}$	21	$21\frac{1}{8}$	$21\frac{1}{4}$	$21\frac{3}{8}$	$21\frac{1}{2}$	$21\frac{5}{8}$	$21\frac{3}{4}$	$21\frac{7}{8}$	22	$22\frac{1}{8}$	$22\frac{1}{4}$	$22\frac{3}{8}$	$22\frac{1}{2}$	$22\frac{5}{8}$	$22\frac{3}{4}$	$22\frac{7}{8}$	23	$23\frac{1}{8}$	$23\frac{1}{4}$	$23\frac{3}{8}$	$23\frac{1}{2}$	$23\frac{5}{8}$	$23\frac{3}{4}$	$23\frac{7}{8}$	24	$24\frac{1}{8}$	$24\frac{1}{4}$	$24\frac{3}{8}$	$24\frac{1}{2}$	$24\frac{5}{8}$	$24\frac{3}{4}$	$24\frac{7}{8}$	25	$25\frac{1}{8}$	$25\frac{1}{4}$	$25\frac{3}{8}$	$25\frac{1}{2}$	$25\frac{5}{8}$	$25\frac{3}{4}$	$25\frac{7}{8}$	26	$26\frac{1}{8}$	$26\frac{1}{4}$	$26\frac{3}{8}$	$26\frac{1}{2}$	$26\frac{5}{8}$	$26\frac{3}{4}$	$26\frac{7}{8}$	27	$27\frac{1}{8}$	$27\frac{1}{4}$	$27\frac{3}{8}$	$27\frac{1}{2}$	$27\frac{5}{8}$	$27\frac{3}{4}$	$27\frac{7}{8}$	28	$28\frac{1}{8}$	$28\frac{1}{4}$	$28\frac{3}{8}$	$28\frac{1}{2}$	$28\frac{5}{8}$	$28\frac{3}{4}$	$28\frac{7}{8}$	29	$29\frac{1}{8}$	$29\frac{1}{4}$	$29\frac{3}{8}$	$29\frac{1}{2}$	$29\frac{5}{8}$	$29\frac{3}{4}$	$29\frac{7}{8}$	30	$30\frac{1}{8}$	$30\frac{1}{4}$	$30\frac{3}{8}$	$30\frac{1}{2}$	$30\frac{5}{8}$	$30\frac{3}{4}$	$30\frac{7}{8}$	31	$31\frac{1}{8}$	$31\frac{1}{4}$	$31\frac{3}{8}$	$31\frac{1}{2}$	$31\frac{5}{8}$	$31\frac{3}{4}$	$31\frac{7}{8}$	32	$32\frac{1}{8}$	$32\frac{1}{4}$	$32\frac{3}{8}$	$32\frac{1}{2}$	$32\frac{5}{8}$	$32\frac{3}{4}$	$32\frac{7}{8}$	33	$33\frac{1}{8}$	$33\frac{1}{4}$	$33\frac{3}{8}$	$33\frac{1}{2}$	$33\frac{5}{8}$	$33\frac{3}{4}$	$33\frac{7}{8}$	34	$34\frac{1}{8}$	$34\frac{1}{4}$	$34\frac{3}{8}$	$34\frac{1}{2}$	$34\frac{5}{8}$	$34\frac{3}{4}$	$34\frac{7}{8}$	35	$35\frac{1}{8}$	$35\frac{1}{4}$	$35\frac{3}{8}$	$35\frac{1}{2}$	$35\frac{5}{8}$	$35\frac{3}{4}$	$35\frac{7}{8}$	36	$36\frac{1}{8}$	$36\frac{1}{4}$	$36\frac{3}{8}$	$36\frac{1}{2}$	$36\frac{5}{8}$	$36\frac{3}{4}$	$36\frac{7}{8}$	37	$37\frac{1}{8}$	$37\frac{1}{4}$	$37\frac{3}{8}$	$37\frac{1}{2}$	$37\frac{5}{8}$	$37\frac{3}{4}$	$37\frac{7}{8}$	38	$38\frac{1}{8}$	$38\frac{1}{4}$	$38\frac{3}{8}$	$38\frac{1}{2}$	$38\frac{5}{8}$	$38\frac{3}{4}$	$38\frac{7}{8}$	39	$39\frac{1}{8}$	$39\frac{1}{4}$	$39\frac{3}{8}$	$39\frac{1}{2}$	$39\frac{5}{8}$	$39\frac{3}{4}$	$39\frac{7}{8}$	40	$40\frac{1}{8}$	$40\frac{1}{4}$	$40\frac{3}{8}$	$40\frac{1}{2}$	$40\frac{5}{8}$	$40\frac{3}{4}$	$40\frac{7}{8}$	41	$41\frac{1}{8}$	$41\frac{1}{4}$	$41\frac{3}{8}$	$41\frac{1}{2}$	$41\frac{5}{8}$	$41\frac{3}{4}$	$41\frac{7}{8}$	42	$42\frac{1}{8}$	$42\frac{1}{4}$	$42\frac{3}{8}$	$42\frac{1}{2}$	$42\frac{5}{8}$	$42\frac{3}{4}$	$42\frac{7}{8}$	43	$43\frac{1}{8}$	$43\frac{1}{4}$	$43\frac{3}{8}$	$43\frac{1}{2}$	$43\frac{5}{8}$	$43\frac{3}{4}$	$43\frac{7}{8}$	44	$44\frac{1}{8}$	$44\frac{1}{4}$	$44\frac{3}{8}$	$44\frac{1}{2}$	$44\frac{5}{8}$	$44\frac{3}{4}$	$44\frac{7}{8}$	45	$45\frac{1}{8}$	$45\frac{1}{4}$	$45\frac{3}{8}$	$45\frac{1}{2}$	$45\frac{5}{8}$	$45\frac{3}{4}$	$45\frac{7}{8}$	46	$46\frac{1}{8}$	$46\frac{1}{4}$	$46\frac{3}{8}$	$46\frac{1}{2}$	$46\frac{5}{8}$	$46\frac{3}{4}$	$46\frac{7}{8}$	47	$47\frac{1}{8}$	$47\frac{1}{4}$	$47\frac{3}{8}$	$47\frac{1}{2}$	$47\frac{5}{8}$	$47\frac{3}{4}$	$47\frac{7}{8}$	48	$48\frac{1}{8}$	$48\frac{1}{4}$	$48\frac{3}{8}$	$48\frac{1}{2}$	$48\frac{5}{8}$	$48\frac{3}{4}$	$48\frac{7}{8}$	49	$49\frac{1}{8}$	$49\frac{1}{4}$	$49\frac{3}{8}$	$49\frac{1}{2}$	$49\frac{5}{8}$	$49\frac{3}{4}$	$49\frac{7}{8}$	50	$50\frac{1}{8}$	$50\frac{1}{4}$	$50\frac{3}{8}$	$50\frac{1}{2}$	$50\frac{5}{8}$	$50\frac{3}{4}$	$50\frac{7}{8}$	51	$51\frac{1}{8}$	$51\frac{1}{4}$	$51\frac{3}{8}$	$51\frac{1}{2}$	$51\frac{5}{8}$	$51\frac{3}{4}$	$51\frac{7}{8}$	52	$52\frac{1}{8}$	$52\frac{1}{4}$	$52\frac{3}{8}$	$52\frac{1}{2}$	$52\frac{5}{8}$	$52\frac{3}{4}$	$52\frac{7}{8}$	53	$53\frac{1}{8}$	$53\frac{1}{4}$	$53\frac{3}{8}$	$53\frac{1}{2}$	$53\frac{5}{8}$	$53\frac{3}{4}$	$53\frac{7}{8}$	54	$54\frac{1}{8}$	$54\frac{1}{4}$	$54\frac{3}{8}$	$54\frac{1}{2}$	$54\frac{5}{8}$	$54\frac{3}{4}$	$54\frac{7}{8}$	55	$55\frac{1}{8}$	$55\frac{1}{4}$	$55\frac{3}{8}$	$55\frac{1}{2}$	$55\frac{5}{8}$	$55\frac{3}{4}$	$55\frac{7}{8}$	56	$56\frac{1}{8}$	$56\frac{1}{4}$	$56\frac{3}{8}$	$56\frac{1}{2}$	$56\frac{5}{8}$	$56\frac{3}{4}$	$56\frac{7}{8}$	57	$57\frac{1}{8}$	$57\frac{1}{4}$	$57\frac{3}{8}$	$57\frac{1}{2}$	$57\frac{5}{8}$	$57\frac{3}{4}$	$57\frac{7}{8}$	58	$58\frac{1}{8}$	$58\frac{1}{4}$	$58\frac{3}{8}$	$58\frac{1}{2}$	$58\frac{5}{8}$	$58\frac{3}{4}$	$58\frac{7}{8}$	59	$59\frac{1}{8}$	$59\frac{1}{4}$	$59\frac{3}{8}$	$59\frac{1}{2}$	$59\frac{5}{8}$	$59\frac{3}{4}$	$59\frac{7}{8}$	60	$60\frac{1}{8}$	$60\frac{1}{4}$	$60\frac{3}{8}$	$60\frac{1}{2}$	$60\frac{5}{8}$	$60\frac{3}{4}$	$60\frac{7}{8}$	61	$61\frac{1}{8}$	$61\frac{1}{4}$	$61\frac{3}{8}$	$61\frac{1}{2}$	$61\frac{5}{8}$	$61\frac{3}{4}$	$61\frac{7}{8}$	62	$62\frac{1}{8}$	$62\frac{1}{4}$	$62\frac{3}{8}$	$62\frac{1}{2}$	$62\frac{5}{8}$	$62\frac{3}{4}$	$62\frac{7}{8}$	63	$63\frac{1}{8}$	$63\frac{1}{4}$	$63\frac{3}{8}$	$63\frac{1}{2}$	$63\frac{5}{8}$	$63\frac{3}{4}$	$63\frac{7}{8}$	64	$64\frac{1}{8}$	$64\frac{1}{4}$	$64\frac{3}{8}$	$64\frac{1}{2}$	$64\frac{5}{8}$	$64\frac{3}{4}$	$64\frac{7}{8}$	65	$65\frac{1}{8}$	$65\frac{1}{4}$	$65\frac{3}{8}$	$65\frac{1}{2}$	$65\frac{5}{8}$	$65\frac{3}{4}$	$65\frac{7}{8}$	66	$66\frac{1}{8}$	$66\frac{1}{4}$	$66\frac{3}{8}$	$66\frac{1}{2}$	$66\frac{5}{8}$	$66\frac{3}{4}$	$66\frac{7}{8}$	67	$67\frac{1}{8}$	$67\frac{1}{4}$	$67\frac{3}{8}$	$67\frac{1}{2}$	$67\frac{5}{8}$	$67\frac{3}{4}$	$67\frac{7}{8}$	68	$68\frac{1}{8}$	$68\frac{1}{4}$	$68\frac{3}{8}$	$68\frac{1}{2}$	$68\frac{5}{8}$	$68\frac{3}{4}$	$68\frac{7}{8}$	69	$69\frac{1}{8}$	$69\frac{1}{4}$	$69\frac{3}{8}$	$69\frac{1}{2}$	$69\frac{5}{8}$	$69\frac{3}{4}$	$69\frac{7}{8}$	70	$70\frac{1}{8}$	$70\frac{1}{4}$	$70\frac{3}{8}$	$70\frac{1}{2}$	$70\frac{5}{8}$	$70\frac{3}{4}$	$70\frac{7}{8}$	71	$71\frac{1}{8}$	$71\frac{1}{4}$	$71\frac{3}{8}$	$71\frac{1}{2}$	$71\frac{5}{8}$	$71\frac{3}{4}$	$71\frac{7}{8}$	72	$72\frac{1}{8}$	$72\frac{1}{4}$	$72\frac{3}{8}$	$72\frac{1}{2}$	$72\frac{5}{8}$	$72\frac{3}{4}$	$72\frac{7}{8}$	73	$73\frac{1}{8}$	$73\frac{1}{4}$	$73\frac{3}{8}$	$73\frac{1}{2}$	$73\frac{5}{8}$	$73\frac{3}{4}$	$73\frac{7}{8}$	74	$74\frac{1}{8}$	$74\frac{1}{4}$	$74\frac{3}{8}$	$74\frac{1}{2}$	$74\frac{5}{8}$	$74\frac{3}{4}$	$74\frac{7}{8}$	75	$75\frac{1}{8}$	$75\frac{1}{4}$	$75\frac{3}{8}$	$75\frac{1}{2}$	$75\frac{5}{8}$	$75\frac{3}{4}$	$75\frac{7}{8}$	76	$76\frac{1}{8}$	$76\frac{1}{4}$	$76\frac{3}{8}$	$76\frac{1}{2}$	$76\frac{5}{8}$	$76\frac{3}{4}$	$76\frac{7}{8}$	77	$77\frac{1}{8}$	$77\frac{1}{4}$	$77\frac{3}{8}$	$77\frac{1}{2}$	$77\frac{5}{8}$	$77\frac{3}{4}$	$77\frac{7}{8}$	78	$78\frac{1}{8}$	$78\frac{1}{4}$	$78\frac{3}{8}$	$78\frac{1}{2}$	$78\frac{5}{8}$	$78\frac{3}{4}$	$78\frac{7}{8}$	79	$79\frac{1}{8}$	$79\frac{1}{4}$	$79\frac{3}{8}$	$79\frac{1}{2}$	$79\frac{5}{8}$	$79\frac{3}{4}$	$79\frac{7}{8}$	80	$80\frac{1}{8}$	$80\frac{1}{4}$	$80\frac{3}{8}$	$80\frac{1}{2}$	$80\frac{5}{8}$	$80\frac{3}{4}$	$80\frac{7}{8}$	81	$81\frac{1}{8}$	$81\frac{1}{4}$	$81\frac{3}{8}$	$81\frac{1}{2}$	$81\frac{5}{8}$	$81\frac{3}{4}$	$81\frac{7}{8}$	82	$82\frac{1}{8}$	$82\frac{1}{4}$	$82\frac{3}{8}$	$82\frac{1}{2}$	$82\frac{5}{8}$	$82\frac{3}{4}$	$82\frac{7}{8}$	83	$83\frac{1}{8}$	$83\frac{1}{4}$	$83\frac{3}{8}$	$83\frac{1}{2}$	$83\frac{5}{8}$	$83\frac{3}{4}$	$83\frac{7}{8}$	84	$84\frac{1}{8}$	$84\frac{1}{4}$	$84\frac{3}{8}$	$84\frac{1}{2}$	$84\frac{5}{8}$	$84\frac{3}{4}$	$84\frac{7}{8}$	85	$85\frac{1}{8}$	$85\frac{1}{4}$	$85\frac{3}{8}$	$85\frac{1}{2}$	$85\frac{5}{8}$	$85\frac{3}{4}$	$85\frac{7}{8}$	86	$86\frac{1}{8}$	$86\frac{1}{4}$	$86\frac{3}{8}$	$86\frac{1}{2}$	$86\frac{5}{8}$	$86\frac{3}{4}$	$86\frac{7}{8}$	87	$87\frac{1}{8}$	$87\frac{1}{4}$	$87\frac{3}{8}$	$87\frac{1}{2}$	$87\frac{5}{8}$	$87\frac{3}{4}$	$87\frac{7}{8}$	88	$88\frac{1}{8}$	$88\frac{1}{4}$	$88\frac{3}{8}$	$88\frac{1}{2}$	$88\frac{5}{8}$	$88\frac{3}{4}$	$88\frac{7}{8}$	89	$89\frac{1}{8}$	$89\frac{1}{4}$	$89\frac{3}{8}$	$89\frac{1}{2}$	$89\frac{5}{8}$	$89\frac{3}{4}$	$89\frac{7}{8}$	90	$90\frac{1}{8}$	$90\frac{1}{4}$	$90\frac{3}{8}$	$90\frac{1}{2}$	$90\frac{5}{8}$	$90\frac{3}{4}$	$90\frac{7}{8}$	91	$91\frac{1}{8}$	$91\frac{1}{4}$	$91\frac{3}{8}$	$91\frac{1}{2}$	$91\frac{5}{8}$	$91\frac{3}{4}$	$91\frac{7}{8}$	92	$92\frac{1}{8}$	$92\frac{1}{4}$	$92\frac{3}{8}$	$92\frac{1}{2}$	$92\frac{5}{8}$	$92\frac{3}{4}$	$92\frac{7}{8}$	93	$93\frac{1}{8}$	$93\frac{1}{4}$	$93\frac{3}{8}$	$93\frac{1}{2}$	$93\frac{5}{8}$	$93\frac{3}{4}$	$93\frac{7}{8}$	94	$94\frac{1}{8}$	$94\frac{1}{4}$	$94\frac{3}{8}$	$94\frac{1}{2}$	$94\frac{5}{8}$	$94\frac{3}{4}$	$94\frac{7}{8}$	95	$95\frac{1}{8}$	$95\frac{1}{4}$	$95\frac{3}{8}$	$95\frac{1}{2}$	$95\frac{5}{8}$	$95\frac{3$
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Lap-Welded Light Wrought Iron Pipe.

WITH SCREW AND COUPLING, FOR OIL, SALT AND GAS WELLS.

Inside Diameter..	2	2 1/4	2 1/2	3	3 1/4	3 1/2	4	4 1/4	5	5 1/4	6 1/4	7 1/4	8 1/4					
Weight per foot..	2.298	2.755	3.045	3.333	3.958	4.275	4.590	5.320	5.500	6.010	7.226	7.667	8.063	9.346	10.064	12.435	15.109	16.15.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES, SEE ACCOMPANYING LIST.

Pipe Cypher for Orders by Telegraph.

NUMBER OF FEET.			SIZE.	BLACK.	SIZE.	GALVANIZED
100	Asia.	7,000	1	Alleghany,	1	Amazon,
200	Belgium,	8,000	1	Baltimore,	1	Bay,
300	Chili,	9,000	1	Camden,	1	Colorado,
400	Denmark,	10,000	1	Detroit,	1	Danube,
500	Egypt,		1	Erie,	1	Elbe,
600	France,		1	Fairmount,	1	Firth,
700	Germany,		1	Galena,	1	Ganges,
800	Holland,		1	Harrisburgh,	2	Hudson,
900	Ireland,		2	Ithaca,	2	India,
1,000	Japan,		2	Jamesstown,	3	Junata,
2,000	Kentucky,		3	Kensington,	3	Kanawha,
3,000	Liberia,		3	Lacon,	3	Lake.
4,000	Maine,		4	Leicester,	4	
5,000	Nevada,		5	Newark,		
6,000	Ohio,		6	Oneida,		

Lap-Welded Boiler Tubes.



Fig. 2.

Outside Diameter.....	1	1 1/2	1 1/4	1 1/2	2	2 1/2	2 1/2	2 1/2	3	3 1/2	3 1/2	4	4 1/2	5	6	7	8	9	10 in
Thickness Wire Gauge.....	15	14	13	13	13	13	12	12	11	11	11	10	10	9	8	8	8	7	6
Weight per foot.....	0.71	0.90	1.25	1.66	1.98	2.24	2.75	3.04	3.33	3.96	4.27	4.59	5.32	6.00	7.23	9.35	12.43	15.11	18.00 22.19

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

CAST IRON STEAM FITTINGS.

ELBOW.



Fig. 3.

Size.... $\frac{1}{2}$ $\frac{3}{4}$ 1 $1\frac{1}{2}$ 2 $2\frac{1}{2}$ 3 $3\frac{1}{2}$ 4 $4\frac{1}{2}$ 5 6 7 8 inch.

REDUCING ELBOW.



Fig. 4.

45° ELBOW.



Fig. 5.

Size.... $\frac{1}{2}$ to 6 inch.

TEE.

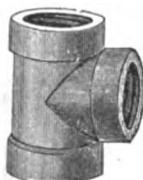


Fig. 6.

Size.... $\frac{1}{2}$ $\frac{3}{4}$ 1 $1\frac{1}{2}$ 2 $2\frac{1}{2}$ 3 $3\frac{1}{2}$ 4 $4\frac{1}{2}$ 5 6 7 8 inch.

REDUCING TEES



Fig. 7.



Fig. 8.

Y BRANCH.



Fig. 9.

$\frac{1}{2}$ to 4 inch.

CROSS.

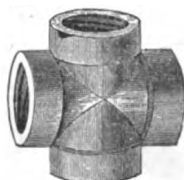


Fig. 10.

Size.... $\frac{1}{2}$ $\frac{3}{4}$ 1 $1\frac{1}{2}$ 2 $2\frac{1}{2}$ 3 $3\frac{1}{2}$ 4 $4\frac{1}{2}$ 5 6 inch.

CLOSE.

RETURN BENDS

OPEN.

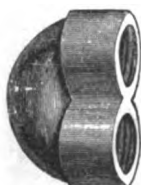


Fig. 11.



Fig. 12.

Size.....	$\frac{1}{2}$	1	$1\frac{1}{2}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6 inches.
Centers of close patterns.....	$1\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$
" open "	$2\frac{1}{2}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	11	18

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

CAST IRON STEAM FITTINGS.

PLUG.



Fig. 13.

REDUCER.

Reducing from 1 to four sizes.



Fig. 14.

COUPLING.

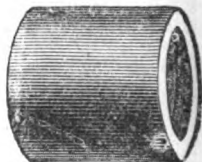


Fig. 15.

For all sizes pipe, $\frac{1}{8}$ to 8 inches.

BUSHING.

Reducing from one to four sizes.



Fig. 16.

LOCK NUT.



Fig. 17.

Size. $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$,
2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4 in.

FLANGE.

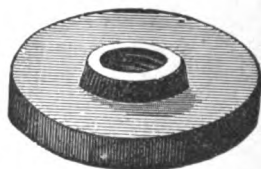


Fig. 18.

All sizes—For Pipe, $\frac{3}{8}$ to 8 in.
For Diam., see Price List.

BLANK FLANGE.

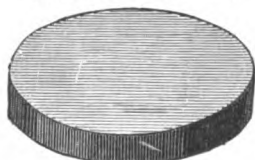


Fig. 19.

Diam., 6, 7, 8, 9, 10, 11, 12 in.

SHOULDER NIPPLE.

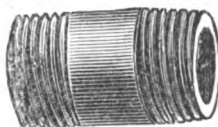


Fig. 20.

All sizes, $\frac{1}{8}$ to 8 in.

CLOSE NIPPLE.



Fig. 21.

MALLEABLE IRON UNION,
With Lip for Washer.

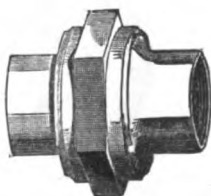


Fig. 22.

Size. $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$ in.

FLANGE UNION,
Cast Iron, Faced.

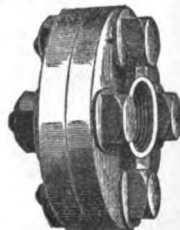


Fig. 23.

Sizes. $\frac{1}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, 6, 8 in.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

FITTINGS FOR WROUGHT IRON PIPE

WROUGHT IRON BEND.

LONG SCREW.



Fig. 24.

Sizes..... $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, $1\frac{3}{4}$, 2 in.

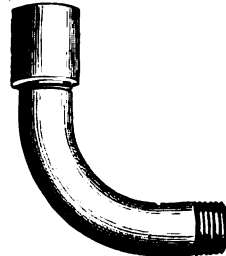


Fig. 25.

Sizes.... $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, 1, $1\frac{1}{2}$, $1\frac{3}{4}$, 2 in.

BRANCH TEES.

SMALL RUN.

LARGE RUN.

WITH BACK OUTLET.

HOOK PLATES.



Fig. 26.

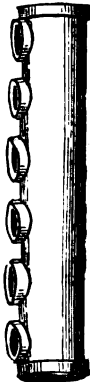


Fig. 27.

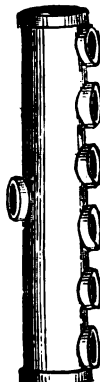


Fig. 28.



Fig. 29.

Sizes..... $\frac{1}{4}$, 1, $1\frac{1}{2}$, $1\frac{3}{4}$, 2 inch.
Centers of Outlets..... $2\frac{1}{2}$, $2\frac{3}{4}$, 3, $3\frac{1}{4}$, $4\frac{1}{4}$
Branch Tees, any number of Outlets, made to order.

For $\frac{1}{4}$ and 1 inch pipe.
1 to 12 Hooks.

EXPANSION PLATE.

COIL STAYS.

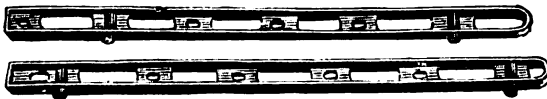


Fig. 30.

For $\frac{1}{4}$ and 1 inch Pipe Coils, 6 to 20 pipes high.

Malleable Iron Fittings, for Steam and Gas, of any size
or pattern and in any quantity.

For $\frac{1}{4}$ and 1 inch pipe.



Fig. 31.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

VALVES.

GLOBE VALVE.
Brass or Iron.

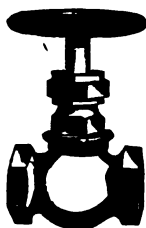


Fig. 32.
 $\frac{1}{4}$ to 6 inches.

ANGLE VALVE.
Brass or Iron.



Fig. 33.
 $\frac{1}{4}$ to 4 inches.

CROSS VALVE.
Brass or Iron.



Fig. 34.
 $\frac{1}{4}$ to 3 inches.

RADIATOR VALVE.
With ground joint Coupling.



Fig. 35.
 $\frac{1}{4}$ to $1\frac{1}{4}$ inches.

FLANGED GLOBE VALVES.

BRASS OR IRON.

IRON.



Fig. 36.

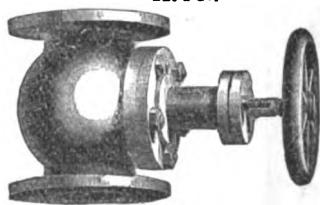


Fig. 37.

1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	8 inch.
4	5	$5\frac{1}{2}$	$6\frac{1}{2}$	7	8	9	10	10	11	12	14 inch.
4	$4\frac{1}{4}$	5	6	$7\frac{1}{4}$	8	$9\frac{1}{4}$	11	11	12	$13\frac{1}{2}$	18 inch.

Fig. 36 is only made 3 in. and smaller of iron and 6 in. and smaller of brass.
Fig. 37 is only made $3\frac{1}{2}$ in. and larger.

ANGLE VALVES.
BRASS.



Fig. 38.

IRON.



Fig. 39.

CROSS VALVE.
IRON.



Fig. 40.

Inside Diam., in....	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Diam. of Flanges, in.	5	$5\frac{1}{2}$	$6\frac{1}{2}$	7	8	9	10	11	12

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

JENKINS' PATENT VALVE.

GATE, GLOBE, ANGLE AND CHECK.

Durable, Reliable, Cheap. No Ground Joints, Consequently no Leaks.

A PERFECTLY TIGHT VALVE AT A REASONABLE PRICE.

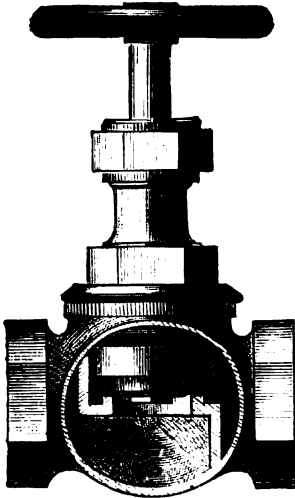


Fig. 41.

The construction of these Valves is new, doing away with the metal Disc, and substituting a compressible packing which has stood the severest tests in steam and destructive fluids.

Twelve years of ACTUAL TEST, and the ENDORSEMENT OF FIRST-CLASS ENGINEERS AND MECHANICS THROUGHOUT THE COUNTRY, has fully demonstrated these Valves to possess the following advantages over all other Valves and Gauge Cocks now in use.

- 1.—A perfectly tight Valve under any and all pressures of steam, oils or gases
- 2.—Sand or grit of any kind will not injure the seat.
- 3.—You do not have to take them off to repair them.
- 4.—They can be repaired by any mechanic in a few minutes.
- 5.—The elasticity of the Disc allows it to adapt itself to an imperfect surface.

In Valves having ground or metal seats, should sand or grit get upon the seat, it is impossible to make them tight except by regrinding, which is expensive when done by hand, and if done by machine soon wears out the valve, and in most cases they have to be disconnected from the pipes, often costing more than a new valve.

JENKINS' PATENT GATE VALVE.

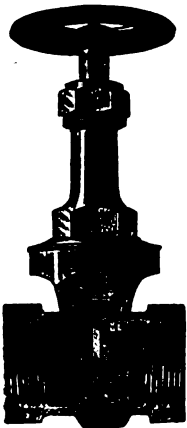


Fig. 42.

The advantages these valves possess over other gate valves, are—

- 1st. They do not depend on a metallic disc for a joint, but use Jenkins' Compressible Packing.
- 2d. As the disc of packing wears, the inclined follower (or metal seat) keeps the disc to its seat, making a perfect joint.
- 3d. Should the discs give out at any time, they can be replaced very quickly, and at a small cost.
- 4th. They do not have to be taken from their places to be repaired.
- 5th. When the valves are only partly open, steam rushing through does not come in contact with the disc, so that it is impossible for the steam to wear holes through it or cut it out, as is too commonly the case with metal disc valves.
- 6th. They are suitable for either Steam, Gas or Water.
- 7th. The spindle is independent of the discs, and there is no danger of their wedging in opening and closing.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PRATT'S PATENT STRAIGHTWAY STOP VALVE.

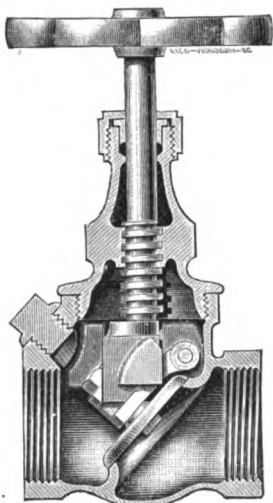


Fig 43.

Every Steam User fully appreciates the satisfaction of having a Stop Valve *for use on Steam or Water*, that combines all the advantages of the best Gate Valves without any of their disadvantages which still exist.

In offering this *Straightway Stop Valve* to the attention of those who have not yet observed its merits, we have the assurance from the many Engineers who have tested its efficiency, that it will never fail to fill all the requirements necessary for a Valve that can be used either for Steam, Water or Gas. It is Straightway, can be kept perfectly tight, is capable of being ground in without being disconnected, the seat of valve being on an angle. No sediment or red lead can lodge there and cause a leak, as by removing the small plug and inserting a screw-driver into the slot in the head of the screw directly under the opening, the disc being made separately can be revolved on the seat, and in this way the Valve can be ground in very readily.

The Valve being closed by the direct pressure of the spindle on the arm carrying the disc, which swings on the hinge secured through the Valve, the disc can rest on a flush seat at an angle of 45° , and thus all friction by wedging is removed.

When the Valve is wide open, the disc is parallel with the body of the Valve, making a full free passage equal to area of pipe connections.

When preferred, we can insert Jenkins' Discs at a small expense.

We feel confident in stating that no Valve has yet been manufactured that can contribute so many inducements for its use, as the Pratt Straightway Stop Valve. Sample orders solicited.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

LUDLOW PATENT GATE VALVES.

FOR WATER, STEAM AND GAS.

DOUBLE GATE BRASS VALVES.

Parallel Seats.

Gland in Stuffing Box.

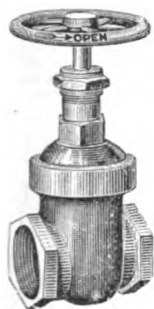


Fig. 44.

Size of Flanged Valves	2 in.	2½ in.	3 in.
Diam. of Flanges.	6 in.	6½ in.	7 in.
Distance from face to face of Flange.	4½ in.	5½ in.	6½ in.

FLANGED VALVE.



Fig. 45.

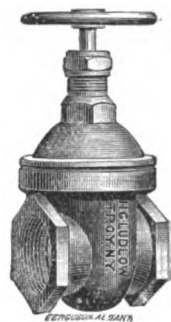


Fig. 46.

QUICK OPENING LEVER GATE VALVE.

Lever and Valves are made of following sizes:

Single gate, iron, brass mounted, 1½ to 8 inches.

Double gate, brass, ½ to 4 in.

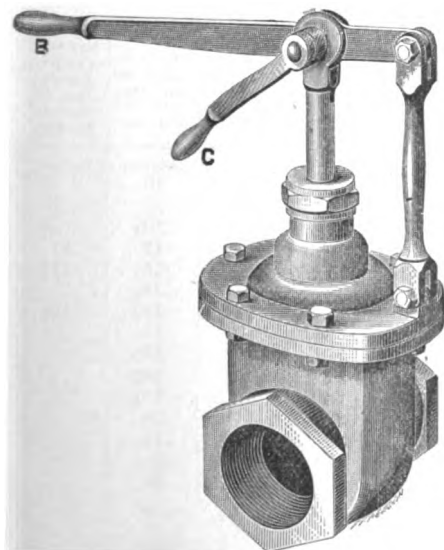


Fig. 47.

HUB VALVE.

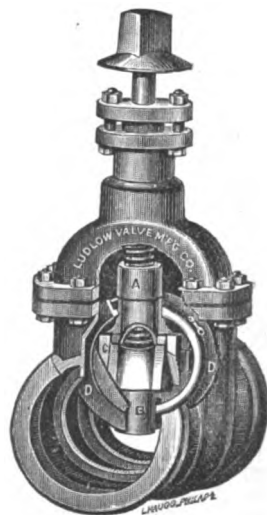


Fig. 48.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES, SEE ACCOMPANYING LIST.

LUDLOW'S SLIDING STOP VALVES.

SINGLE GATE.

Dimensions of Flanged, Hub and Screwed Valves, all iron and iron body, brass mounted.

Size.	Diameter of Standard Flange.	Measurement from face to face of Flanges	Measurement from end to end of Hubs.	Measurement from face to face of Screw Socket.	Size.	Diameter of Standard Flange.	Measurement from face to face of Flanges.	Measurement from end to end of Hubs.
Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
1½	..	..	..	..	14	20	13½	15½
2	6½	5½	..	4½	16	22	13½	15½
2½	7	6½	..	5½	18	24	14	15½
3	8	6¾	8¾	5½	20	26	15½	17
3½	8½	8½	9½	7	24	31	17	17
4	9	8½	9½	7½	30	37	..	20½
*5	10	10½	12	11	..	..	..	..
6	11	11½	12½	11½	..	..	..	..
7	12	11½	13½	..	..	..	..	..
8	13	11	14½	..	..	..	..	..
10	16	12¾	14½	..	..	..	..	..
12	18	12¾	14½	..	..	..	..	..
*3	8	8	10	7½	..	..	..	..
*4	9	8½	10½	7½	..	..	..	..

DOUBLE GATE IRON VALVES.

All iron and iron body brass-mounted. To bear extra heavy pressure either side (1).

To bear heavy pressure either side.

Iron body, brass mounted (2).

Size.	Diameter of Standard Flange.	Measurement from face to face of Flanges.	Measurement from end to end of Hubs.	Measurement from face to face of Screw Socket.	Size.	Diameter of Standard Flange.	Measurement from face to face of Flanges.	Measurement from end to end of Hubs.	Measurement from face to face of Screw Socket.
Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
1½	..	..	..	..	3	8	8	10	7½
2	6½	5½	..	4½	3½	8½	8½	..	7
2½	7	6½	..	5½	4	9	8¾	10½	7½
3	8	6¾	8¾	5½	5	10	10½	12	11
3½	8½	8½	9½	7	6	11	11½	13½	11½
4	9	8½	9½	7½	7	12	11½	13½	..
5	10	10½	12	11	8	13	13½	13½	13½
6	11	11½	12½	11½	10	16	15	15½	..
7	12	11½	13½	..	12	18	15½	15½	..
8	13	11	14½	..	14	21	15½	15½	..
10	16	12¾	14½	..	16	23	16	15½	..
12	18	12¾	14½	..	18	25	17	18	..
14	20	13¾	15½	..	20	27	17½	19½	..
16	22	13¾	15½	..	24	31	21	22½	..
18	24	14	15½	..	30	37½	22½	24	..
20	26	15½	17	..	36
24	31	17	17	..	42
30	37	..	20½	..	48

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FOR PRICES SEE ACCOMPANYING LIST.

THROTTLE VALVE - IRON BODY.

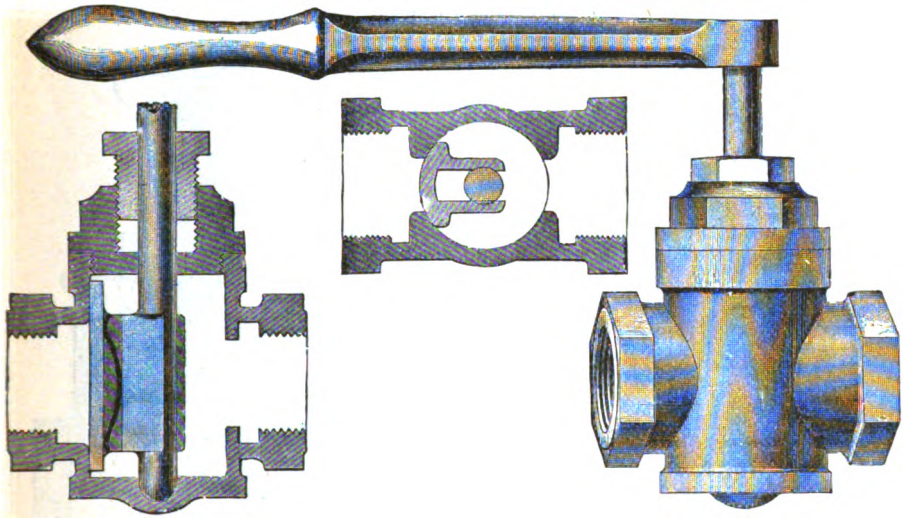


Fig. 49.

Size, 1 1½ 1½ 2 2½ inch.

BACK PRESSURE VALVE—IRON BODY.

Screwed or Flanged.

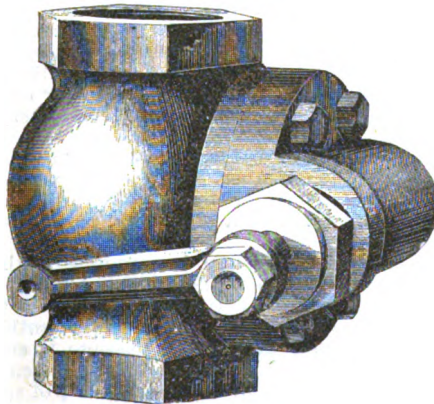


Fig. 50.

Size, 2 2½ 3 3½ 4 inch screwed.

Size, 2 2½ 3 3½ 4 5 6 8 inch flanged.

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FOR PRICES SEE ACCOMPANYING LIST.

CURTIS PRESSURE REGULATOR, FOR STEAM, WATER OR GAS.

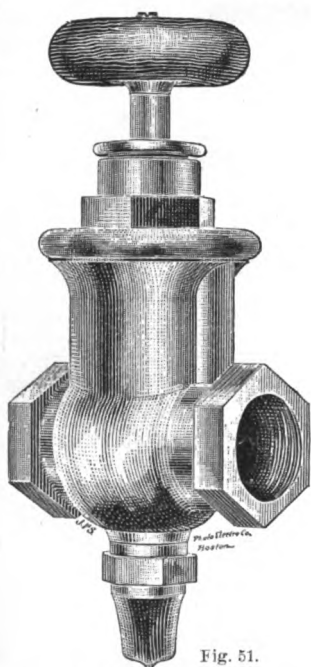


Fig. 51.

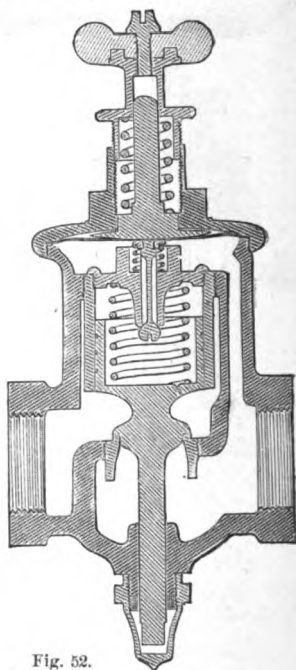


Fig. 52.

This Regulator will maintain the pressure or escape of steam, water, gas or compressed air, to any amount desired, whether low or high pressure.

It is used on Steam Heating Apparatus, Dryers, Air Pumps, Water Motors, Water Tanks; also in Sugar Houses, Bleacheries, Dye Houses, Water Works, and in every instance where the pressure of GAS or FLUIDS needs to be controlled automatically. It occupies the same space as a Globe Valve for the same size pipe, has no glands or packing, and is made *entirely of metal*, being very simple and easily understood.

The sectional view shows a main valve, operated by a loose-fitting piston; a secondary valve in the top of the chamber, over the piston; a metallic diaphragm performing the double office of operating the secondary valve, and making a steam joint to the cap which contains it; and a side passage, connecting the chamber under the diaphragm with the outlet.

When the spring over the diaphragm is compressed, the diaphragm gives way, and thus opens the secondary valve upon which it rests.

Steam from the boiler being let on, raises the piston, and therewith the main valve, to its full capacity. The main valve remains open until the back pressure communicated from the outlet through the side passage is sufficient to raise the diaphragm, and thus close the secondary valve, when the steam, escaping around or through the loose-fitting piston, fills in the space on top of said piston, and forces it towards its seat, thus uniformly maintaining the pressure at which it is set.

To make sure that enough steam passes the piston to produce the required pressure on top of it, an adjustable set-screw is placed in the piston, making a very minute opening through the piston; this must always be kept open.

Care must be taken to thoroughly clean the pipes by blowing steam through them, to prevent chips or scales from getting on the seat.

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FOR PRICES SEE ACCOMPANYING LIST.

WATSON'S PATENT PRESSURE REGULATOR, FOR STEAM.

ADOPTED BY THE UNITED STATES GOVERNMENT.

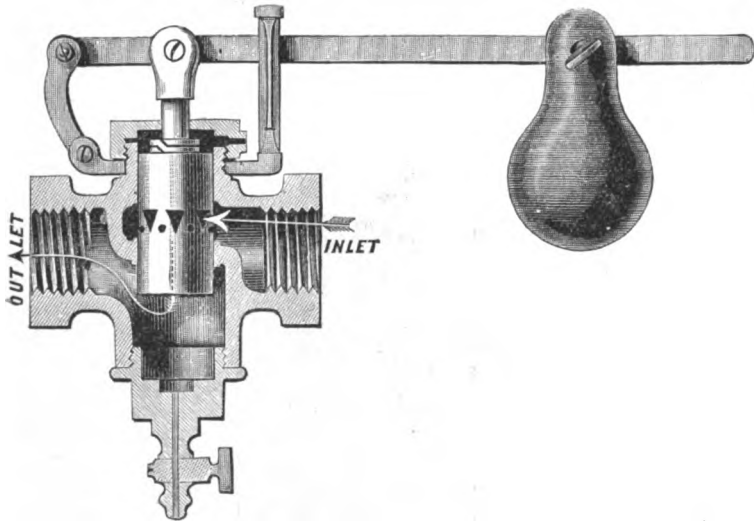


Fig. 53.

We would call your special attention to Watson's Improved Pressure Regulator for reducing and keeping at a uniform pressure the Steam in Drying Cylinders, Evaporating Pans, Steam Heating, etc.

By the use of this Regulator, the steam while at a high pressure may be brought directly to the cylinder; here, in passing through the Regulator, the pressure is cut down to the required. For instance:

A Drying Cylinder requires a pressure of say 8 pounds to dry so much per hour, but the boilers must carry 70 or 80 pounds to drive the engine: how can we get clear of this excess of pressure without waste? The Regulator will do this by simply moving the ball until the gauge indicates the 8 pounds pressure. Once set, no further attention is required, but it will quietly regulate itself to the pressure in the boilers no matter how it may vary, provided of course, it is always above the required 8 pounds.

In steam heating where the boiler is run at a high pressure, for power, this Regulator can be attached to the heating pipe and the pressure reduced to ten or twenty pounds as required, preventing the danger of bursting the radiators, and in warm weather the pressure can be reduced accordingly.

The Regulator should be used on every steam pump in the Coal Mines, as it can be set so as to give the pump an even pressure of steam, no matter how great Boiler variation may be; and insure its running at any required speed, thereby requiring but little attention after starting:

We claim the following advantages for this Regulator over all others:

- 1st. It is metal throughout all its parts.
- 2d. It has no gum or other diaphragm to blow out.
- 3d. It requires no packing.

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FOR PRICES SEE ACCOMPANYING LIST.

CROSBY

ADJUSTABLE POP SAFETY VALVE.

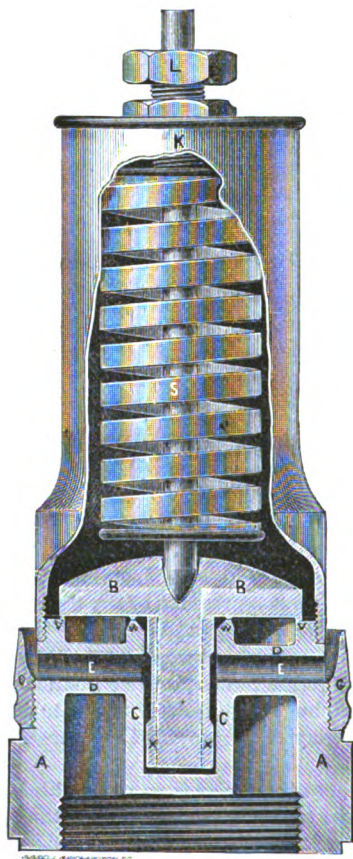


Fig. 54.

This cut represents the valve as designed for locomotive use, one-half size. Each of these valves is tested under steam pressure and set to open at the exact point of pressure desired, and is adjusted to close at about two pounds reduction ordinarily; both of these points can be readily changed by the operator without removing it from the boiler or reducing steam. It is believed any person of ordinary intelligence will readily understand the principle and operation of this valve by the following description: see next page.

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FOR PRICES SEE ACCOMPANYING LIST.

CROSBY'S ADJUSTABLE POP SAFETY VALVE.

DESCRIPTION.

The valve proper B B rests upon two flat annular seats V V and W W on the same plane, and is held down against the pressure of steam by the steel spiral spring S. The tension of this spring is caused by screwing down the threaded bolt L at the top of the cylinder K. The area contained between the seats W and V is what the steam pressure acts upon, ordinarily, to overcome the resistance of the spring. The area contained within the smaller seat W W is not acted upon at all until the valve opens.

The large seat V V is formed on the upper edge of the shell or body of the valve A A. The smaller seat W W is formed on the upper edge of a cylindrical chamber or well C C, which is situated in the center of the shell or body of the valve, and is held in its place by four arms D D radiating horizontally at right angles to each other and connecting it with the body or shell of the valve. These arms are hollow, and form four passages E E for the escape of the steam or other fluid from the well into the air when the valve is open. This well is deepened so as to allow the wings X X of the valve proper to project down into it far enough to act as guides. The area of the apertures, at the outer ends of the passages through the arms, is reduced more or less at will, by screwing up or down the adjustable ring G G.

ACTION OF THE VALVE WHEN WORKING UNDER STEAM.

When the pressure under the valve is within about one pound of the maximum pressure required, the valve will open slightly, and the steam will escape under the larger seat into the cylinder surrounding the spring, thence into the air; the steam is also forced under the smaller seat into the well, and thence through the passages in the arms into the air. As soon as the pressure attains the exact maximum point, the valve will be lifted so high as to force the steam into the well faster than it can escape through the apertures in the arms; a pressure will then accumulate under the inner seat, which will be in excess of what was required to overcome the increasing resistance offered by the spring, and acting upon the additional area presented, at once forces the valve wide open and rapidly relieves the boiler. This pressure under the inner seat is of itself differential. The valve then at once slowly settles down and the pressure under the inner seat as slowly diminishes, and so continues until the area of the opening, under the smaller or inner seat, is less than the area of the apertures in the arms for the escape of the steam; the pressure then ceases and the valve promptly closes. The point of opening can be readily changed while under steam by screwing the threaded bolt at the top of the cylinder, either up or down; and the point of closing is as easily adjusted, by screwing up or down the ring surrounding the outside shell or body of the valve. The seats of this valve are flat, and do not wear out and leak so readily as bevelled seats.

Sizes, 1 1½ 1¾ 2 2½ 3 3½ 4 5 6 inch.

Lockup and Iron Case Valves, same price as ordinary.

In ordering, *always state pressure at which valve shall open.*

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FOR PRICES SEE ACCOMPANYING LIST.

SAFETY VALVES.

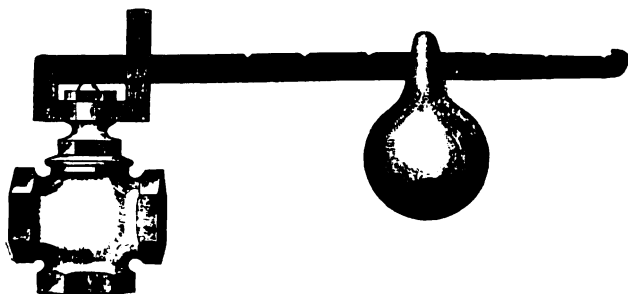


Fig. 55.

BRASS OR IRON.—SCREWED.

Size pipe thread.....1, 1½, 1¾, 2, 2½, 3, 3½, 4, 5, 6 in.

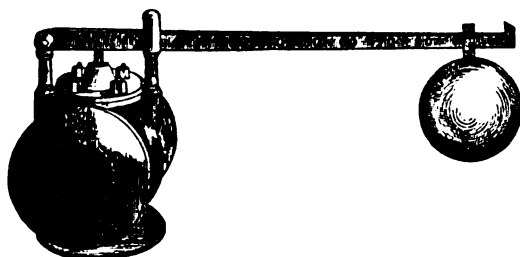


Fig. 56.

IRON.—FLANGED.

Inside Diam.....2, 2½, 3, 3½, 4, 5, 6, in. | Diam of Flange...6½, 7, 8, 9, 10, 11, 12 in.

All Valves designated as "Iron" are *brass mounted*.

CHECK VALVES.—Brass.

HORIZONTAL.



Fig. 57

ANGLE.



Fig. 58

VERTICAL.



Fig. 59

VERTICAL.
Cap on side.

Fig. 60

Size pipe thread.....½, ¾, 1, 1½, 2, 2½, 3 in.

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FOR PRICES SEE ACCOMPANYING LIST.

THE PATENT

Straightway Swinging Check Valve,

FOR USE ON ALL KINDS OF BOILERS.

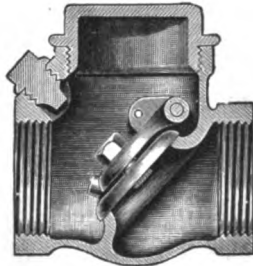


Fig. 61.

This Check Valve overcomes all difficulties experienced when using the ordinary Check Valve, having the guide and stem, which is liable to stick on account of the stem being expanded when heated, which will prevent the disc from falling to its seat. If the stem was made smaller, it would be too loose, and the disc could not then properly seat itself.

The Straightway Swinging Check Valve has a Clapper swinging loosely on the pin secured through the Valve, and the disc being loose on the Clapper, can seat itself truly. As the disc is made separately, it can be ground in the same as other Valves.

In the use of this Valve no sediment can lodge on its seat, and being straightway, can deliver very rapidly; also can be placed either in a horizontal or vertical position, and is always a tight, reliable Check Valve for boilers.

These Valves are made of

Brass, screwed, from - - - - $\frac{1}{4}$ to 2 inch.

Iron Body, brass mounted, screwed, from $1\frac{1}{4}$ to 4 "

" " flanged ends, from - - - $2\frac{1}{2}$ to 10 "

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FOR PRICES SEE ACCOMPANYING LIST.

STEAM COCK—Brass or Iron.

SQUARE OR FLAT HEAD.

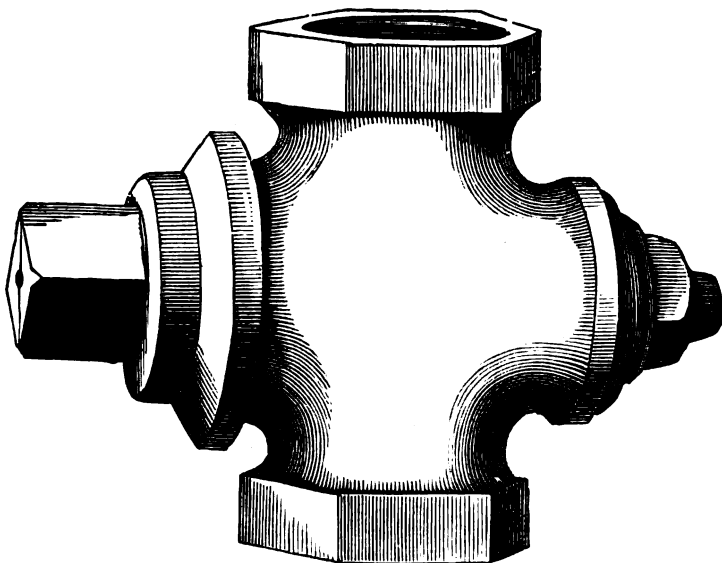


Fig. 62.

Size Pipe Thread, 1, 3, 4, 1, 1, 1, 1, 2, 2, 3, 3, 4 in.
Extra Heavy 1, 1, 1, 1, 2, 2, 3, 3

THREE-WAY STEAM COCK.

BRASS, SCREW OR FLANGED ENDS.

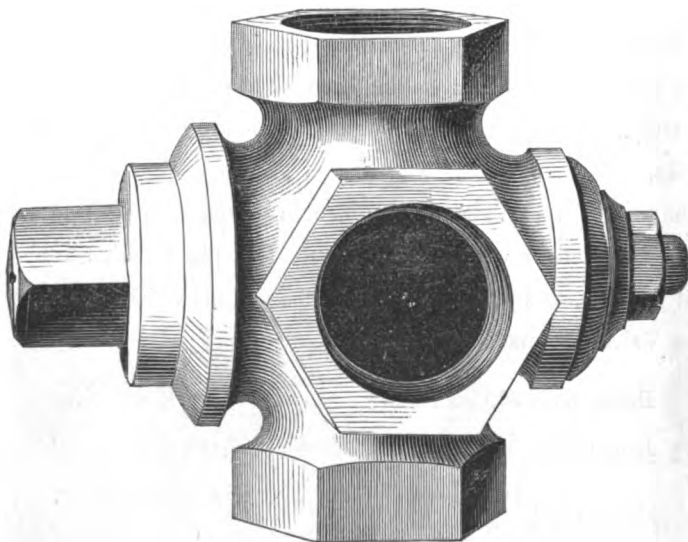


Fig. 63.

Size Pipe.... 1, 1, 1, 1, 1, 1, 2, 2, 3 in.
Diam. Flanges.... 4, 5, 6, 7, 7, 7

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FOR PRICES SEE ACCOMPANYING LIST.

WHISTLE VALVE.

FITT'S GOVERNOR AND STOP VALVES.

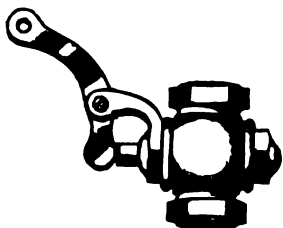


Fig. 64.

Size of pipe thread.

$\frac{1}{4}$ 1 1 $\frac{1}{2}$ 1 $\frac{1}{2}$ 2 2 $\frac{1}{2}$ 3 inch.

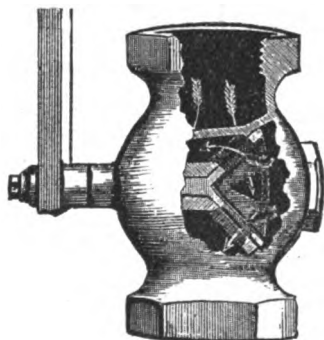


Fig. 65.

Size, $\frac{1}{4}$ 1 1 $\frac{1}{2}$ 1 $\frac{1}{2}$ 2 2 $\frac{1}{2}$ 3 4 6 inch.

Several kinds are made upon the same principle, with a varying arrangement adapting them to the character of the service required.

The peculiar construction of these valves ensures durability in use, and adapts them to many uses for which other valves are not applicable, as for steam, water and Gas Pressure Regulators, and also for Elevators, and as a float valve for water tanks.

No. 3.

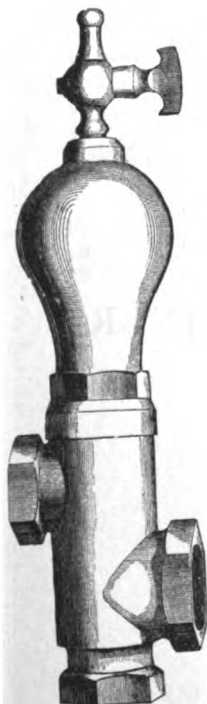


Fig. 68.

PUMP VALVES, STEAM METAL.

No. 2.

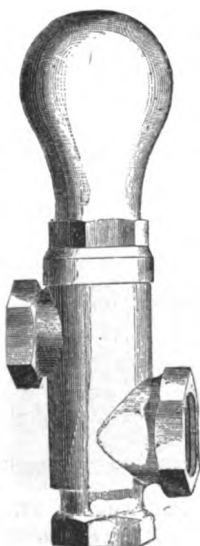


Fig. 67.

No. 1.

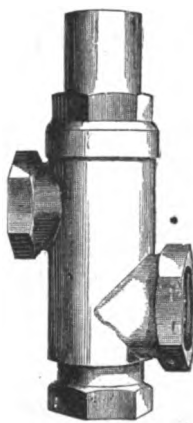


Fig. 66.

Sizes, $\frac{1}{4}$ $\frac{1}{2}$ 1 1 $\frac{1}{2}$ 1 $\frac{1}{2}$ inches.

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FOR PRICES SEE ACCOMPANYING LIST.

Foot Valves and Strainers.—Rough.

BRASS AND IRON, FOR IRON PIPE.

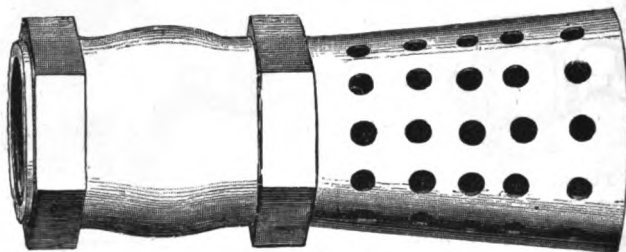


Fig. 69.

BRASS, FOR LEAD OR COPPER PIPE.

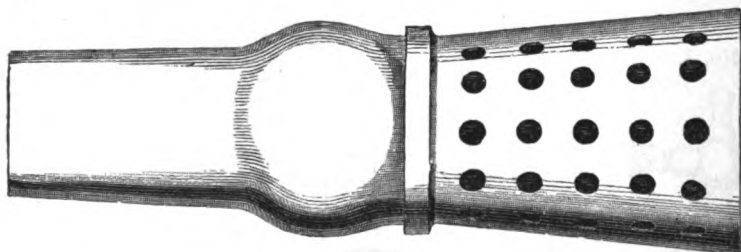


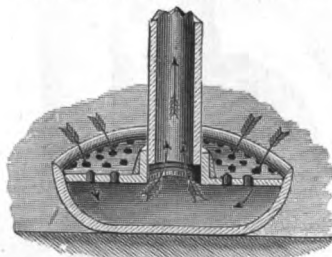
Fig. 70.

SIZES:

For Iron Pipe, Brass.....	$\frac{3}{4}$ to 2 inches.
" " " Iron.....	$\frac{3}{4}$ to 6 "
" Lead or Copper Pipe.....	$\frac{3}{4}$ to 2 "

PATENT MUSHROOM STRAINER.

FOR ALL SUCTION PIPES.



Pat. Aug. 20, 1872.

Fig. 71.

Size,.....1, $1\frac{1}{2}$, $1\frac{3}{4}$, 2, $2\frac{1}{2}$, 3 inch.
 We also make galvanized iron strainers of following sizes:—4, 5, 6, 7, 8, 9 inch.
 Larger sizes to order.

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FOR PRICES SEE ACCOMPANYING LIST.

EXPANSION JOINTS.

STEAM METAL.

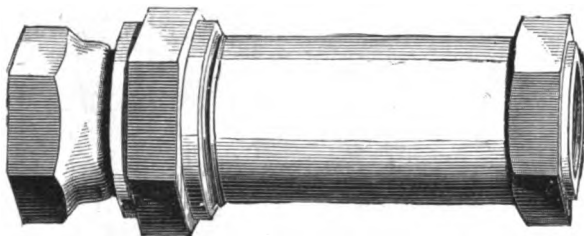


Fig. 72.

Size, $\frac{1}{2}$ 1 $1\frac{1}{2}$ $1\frac{3}{4}$ 2 $2\frac{1}{2}$ and 3 inch.

IRON BODY—BRASS SLEEVE.

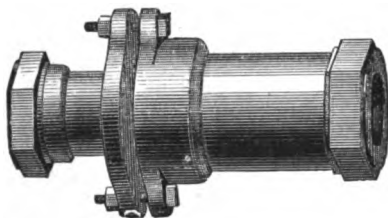


Fig. 73.

Size, 2 $2\frac{1}{2}$ 3 $3\frac{1}{2}$ 4 inch.

IRON BODY—FLANGED ENDS.

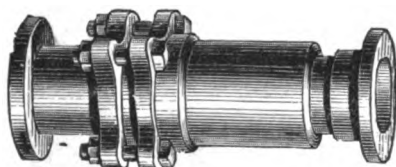


Fig. 74.

Size, 3 $3\frac{1}{2}$ 4 5 6 8 inch.

MIGNAULT'S UNIVERSAL ANGULAR KNUCKLE JOINT,

For steam, gas, air brakes and steam rock drills. No hose required. All connections made with iron pipes.

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FOR PRICES SEE ACCOMPANYING LIST.

AIR COCKS.

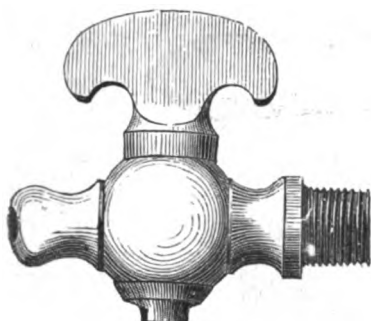


Fig. 76.

Size pipe thread, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ inch.

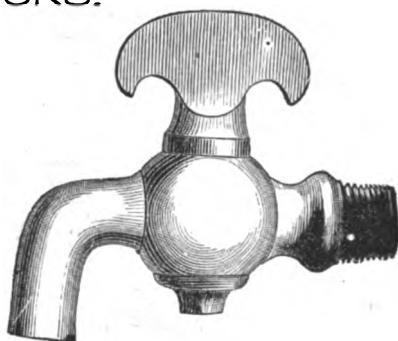


Fig. 77.

Size of pipe thread, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ inch.

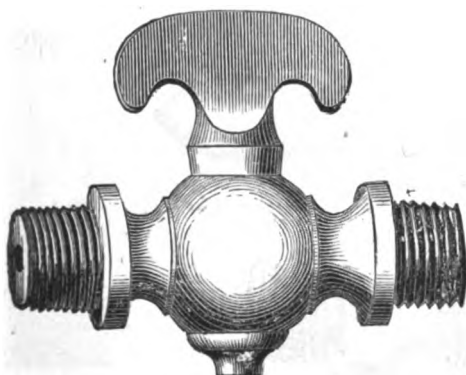


Fig. 78.

Size of pipe thread, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ in.

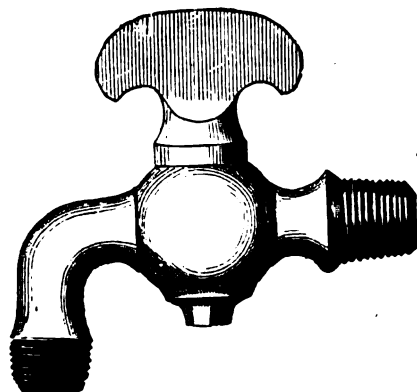


Fig. 79.

Size of pipe thread, $\frac{1}{4}$, $\frac{1}{2}$ inch.

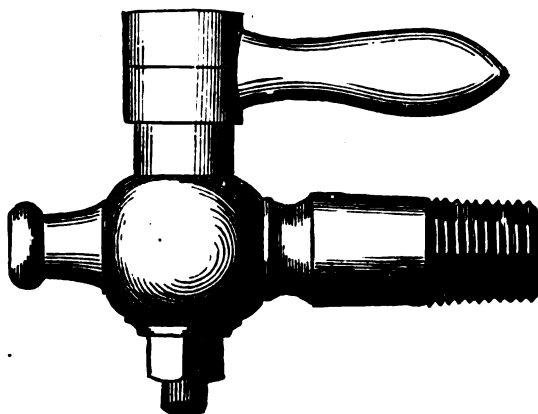


Fig. 80.

Size pipe thread, $\frac{1}{4}$ inch.

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FOR PRICES SEE ACCOMPANYING LIST.

AIR COCKS.

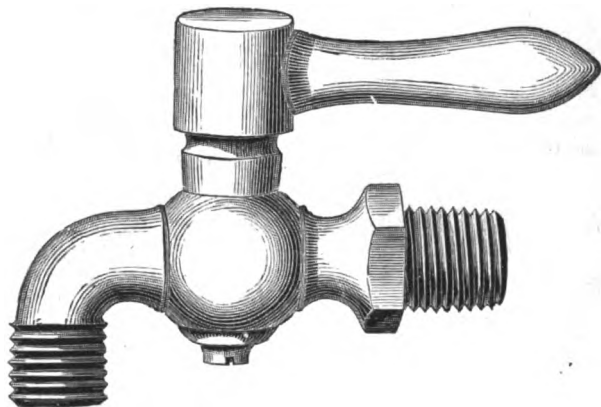


Fig. 81.

Size pipe thread... $\frac{1}{4}$, $\frac{3}{8}$ inch.

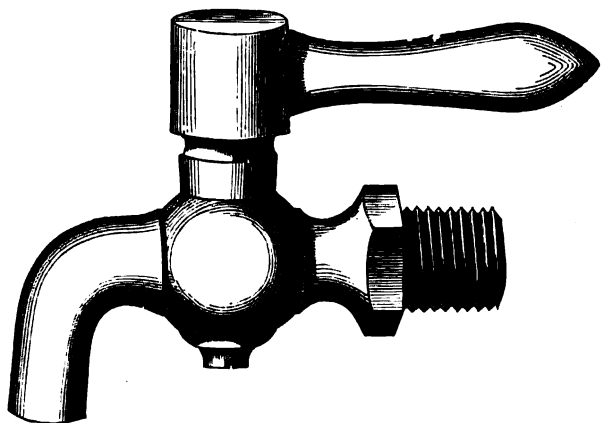


Fig. 82.

Size pipe thread... $\frac{1}{4}$, $\frac{3}{8}$ inch.

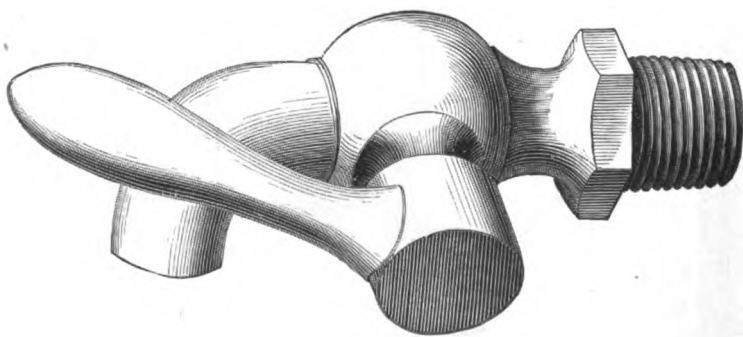


Fig. 83.

Size pipe thread... $\frac{1}{4}$, $\frac{3}{8}$ inch.

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FOR PRICES SEE ACCOMPANYING LIST.

CYLINDER COCKS.

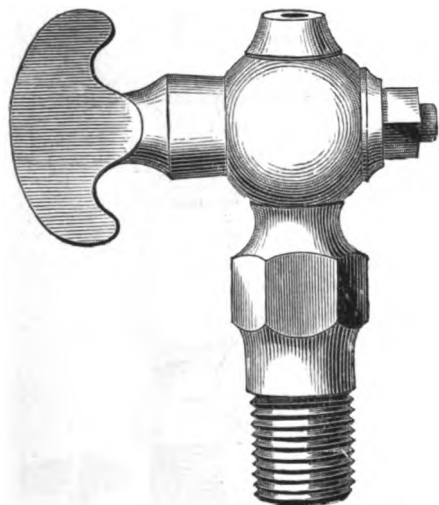


Fig. 84.

Size pipe thread, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ in.

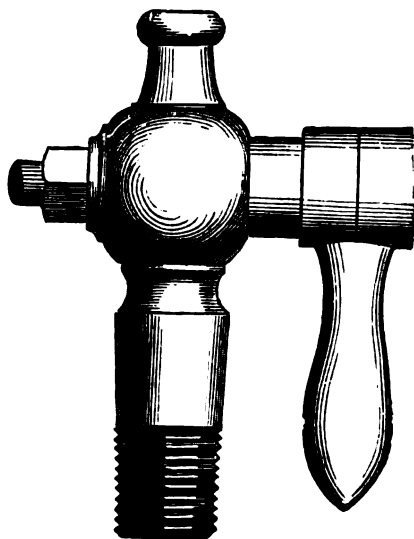


Fig. 85.

Size pipe thread, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ in.

GAUGE COCKS.

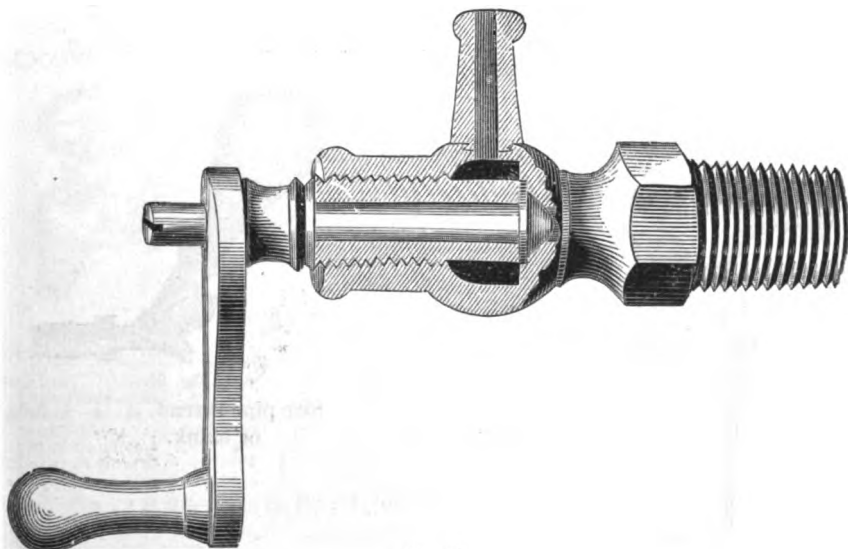


Fig. 86.

Size pipe thread..... $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ in.

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FOR PRICES SEE ACCOMPANYING LIST.

GAUGE COCKS.

WITH BRASS OR SOFT METAL SEATS. WOOD HANDLE, LOOSE VALVE.

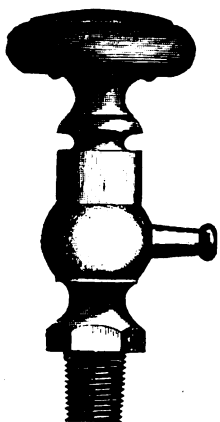


Fig. 87.

Size, $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ inch.

LOCOMOTIVE GAUGE COCK.

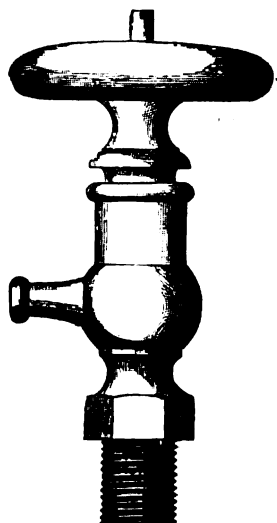


Fig. 88.

Size, $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ inch.

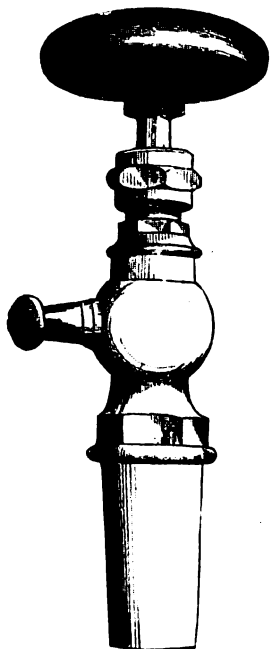


Fig. 89.

Size, $\frac{1}{4}$ inch, blank.

REGISTER'S PATENT GAUGE COCK.

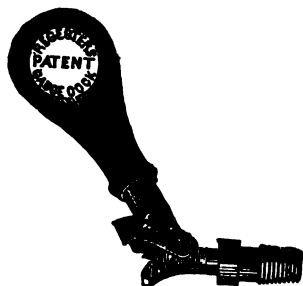


Fig. 90.

Size pipe thread, $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ inch.
or blank.

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FOR PRICES SEE ACCOMPANYING LIST.

STEAM AND WATER GAUGE COLUMNS.

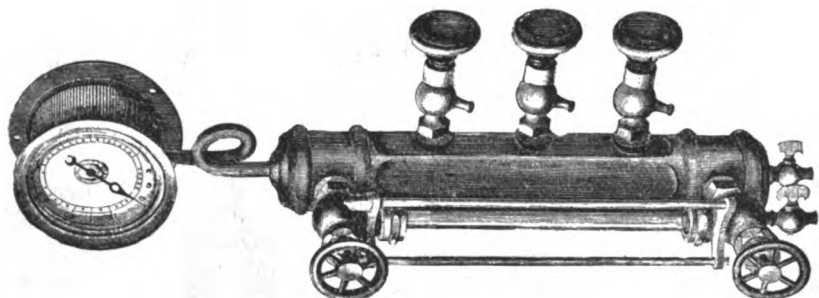


Fig. 94.

No. 1, $\frac{1}{2}$ inch Boiler Connections, 12 inch centers.
 " 2, $\frac{1}{4}$ " " " 16 "

WATER GAUGES.

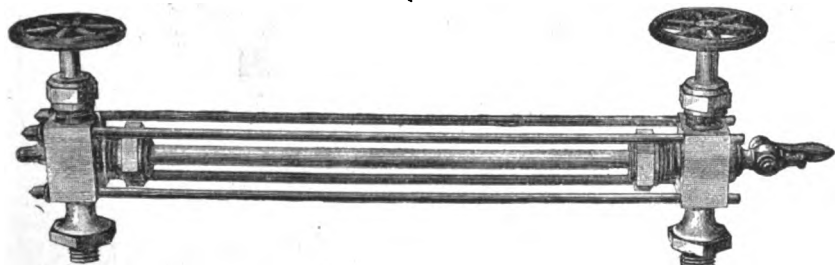


Fig. 93.

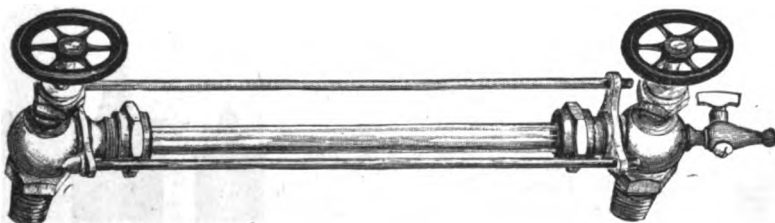


Fig. 92.

DESCRIPTION.

Figure.....	92										93		
Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Size pipe thread, in	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Between centers...	12	13	16	13	16	13	16	13	16	20	16	20	16
Size of Glass	$\frac{1}{2} \times 10$	$\frac{1}{2} \times 11$	$\frac{1}{2} \times 14$	$\frac{1}{2} \times 11$	$\frac{1}{2} \times 14$	$\frac{1}{2} \times 11$	$\frac{1}{2} \times 14$	$\frac{1}{2} \times 11$	$\frac{1}{2} \times 14$	$\frac{1}{2} \times 18$	$\frac{1}{2} \times 14$	$\frac{1}{2} \times 18$	$\frac{1}{2} \times 14$
Style of Handles..	Iron	Iron	Iron	Iron	Iron	Wood	Wood	Wood	Wood	Wood	Iron	Iron	Iron
Number of Guards	2	2	2	4	4	4	4	2	2	2	4	4	2

No. 12 is the same as No. 11, but with flanges instead of pipe threads.

BEST SCOTCH GLASS TUBES OF ALL SIZES.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

STEAM WHISTLES.

WITH SPRING VALVE.

Diam. of Bell.	Size of Pipe.
1 in.	$\frac{3}{8}$ in.
1½ "	$\frac{1}{2}$ "
2 "	$\frac{3}{4}$ "

Fig. 95.

WITHOUT VALVE.

Diam. of Bell.	Size of Pipe.
1 in.	$\frac{1}{4}$ in.
1½ "	" "
2 "	" "
2½ "	" "
3 "	1 "
3½ "	1½ "
4 "	1¾ "
5 "	1½ "
6 "	2 "
8 "	2½ "
10 "	2½ "
12 "	3 "

Fig. 96.



Fig. 97.

Diam. of Bell.	Size of Pipe.
1 in.	$\frac{1}{4}$ in.
1½ "	$\frac{3}{8}$ "
2 "	$\frac{1}{2}$ "
2½ "	$\frac{3}{4}$ "
3 "	1 "
3½ "	1½ "
4 "	1¾ "
5 "	1½ "
6 "	2 "

STEAM WHISTLES AND WHISTLE CHIMES.



Fig. 98.

Diam. of Bell.	Size of Pipe.
1½ in.	$\frac{3}{8}$ "
2 "	$\frac{1}{2}$ "
2½ "	$\frac{3}{4}$ "
3 "	1 "
3½ "	1½ "
4 "	1¾ "
5 "	1½ "
6 "	2 "
8 "	2½ "



Fig. 99.

Made to order with Brass or Iron connections, any size or number of whistles.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

SINGLE BELL STEAM CHIME WHISTLE.

This is one of the best things that has been invented for some time. One whistle produces the same sound for which three whistles have usually been used. The price is not much more than a single one of the common make, it uses no more steam, and yet produces a more harmonious and agreeable sound than any number of common whistles that may be used. It can be distinguished from any other as far as it can be heard, can be heard at a greater distance in case of fog or bad weather, and does not cost much more than one-third the price of other chime whistles usually used. Whistles are all made of the best composition metal, and are finished and polished, and are all ready to screw on to valve or steam pipe.

Description of Engraving.

The Whistle in the above cut is precisely the same as one of the ordinary kind, with the

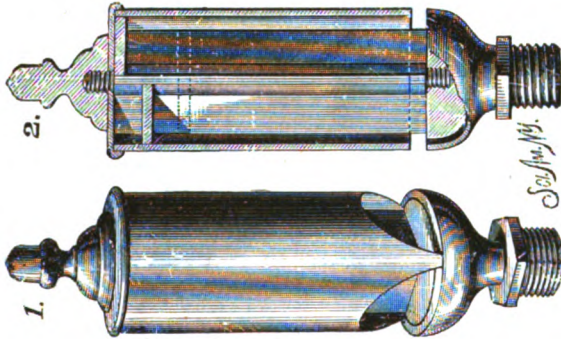


Fig. 100.

Diameter of Bell, inches.....	2,	3,	4,	5,	6,	8,	10,	12,
Size Pipe Thread, ".....	$\frac{1}{2}$,	1,	1 $\frac{1}{4}$,	2,	2 $\frac{1}{2}$,	3,		

exception of the bell on upper part, which is divided into three compartments (five may be used). Each compartment being of different length, the three compartments form in fact three distinct whistles combined in a single tube or shell. There being the proper difference in the length of each compartment, the sounds from the three compartments or whistles chord and produce a musical and agreeable sound.

The usual way of producing a combination of sounds by means of steam whistles, is to attach three or more to a steam pipe in such a way that they may be blown simultaneously; but this incurs the expense of three whistles and a lot of pipe fittings, and wastes an appreciable amount of steam. By the peculiar construction of the mouth of the whistle represented in Fig. 100, any pressure of steam may be used without adjusting the bell. Sectional view shows the divisions inserted into the bell of whistle of ordinary construction.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Fitts' Patent Steam Gongs.



8 feet.

Fig. 101.

12 inch. 3 bells.
3 in. supply pipe.



6 feet.

Fig. 102.

12 inch.
3 in. supply pipe.



4 feet.

Fig. 103.

8 inch.
2 in. supply pipe.



3 feet.

Fig. 104.

6 inch.
1½ in. supply pipe.

Fitts' Patent Steam Gong is used for fire alarm and fog signals, and as a call in the manufactory. Six sizes are manufactured.

Its construction is novel and peculiar, entirely unlike the ordinary steam whistle. It has two bells instead of one, as in the steam whistle. These bells are so adjusted and tuned as to produce a musical fifth cord, or, with the addition of a third bell, a fifth and eight. This entirely obviates the harsh sound of the whistle, and by following the law of atmospheric harmonic vibration, while their tones are soft and pleasant near by, their power of sound is immensely increased. The different sizes are toned to different notes of the musical scale, and by various combinations may be varied in pitch to a limited extent. They have been heard thirty miles, thus showing their vast powers of sound. It can be applied to any common boiler, as the quantity of steam required to sound it is trifling.

DIRECTIONS FOR CONNECTING TO BOILER.

Connect to the main pipe, or to the boiler itself, in such a manner that the water from the condensed steam will run back into the boiler. Carry your pipe to the top of the buildings, place the Gong upon it, with the valve as near the Gong in all cases as practicable. Be careful to keep all red lead and other foreign substances from the pipe in putting up.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

CROSBY'S IMPROVED PRESSURE GAUGE.

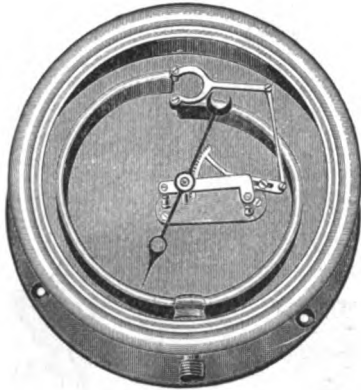


Fig. 105.

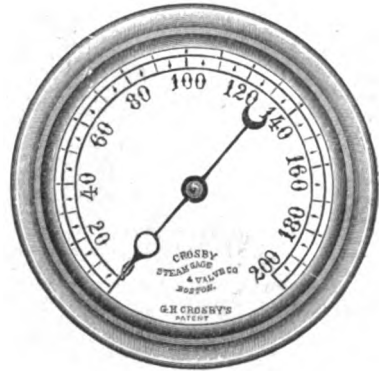


Fig. 106.

SIZES OF CROSBY'S PATTERN GAUGES.

Number..... 0, 1, 2, 3, 4, 5	Number..... 1½, 2½, 3½, 4½, 5½
Size dial, in..... 10, 8½, 6½, 6, 5½, 4½	Size dial, in..... 8½, 6½, 6, 5½, 4½
All of above with solid brass case.	All of above, iron case, brass rim.

SIZES OF BOURDON, PATTERN PRESSURE AND VACUUM GAUGES.

Number..... 0, 1, 2, 3, 4, 5, 6, 7	Number..... 1½, 2½, 3½, 4½, 5½, 6½, 10
Size of dial, in. 10, 8½, 6½, 6, 5½, 4½, 3½, 2½	Size of dial, in. 8½, 6½, 6, 5½, 4½, 3½, 5
All of above with solid brass case.	All of above, iron case, brass rim.

Although it is conceded that the hollow spring gauge, as invented by Bourdon, excels in delicacy and sensitiveness, yet owing to its peculiar construction it is not altogether adapted for general use. It has been found that a spring held only at one end vibrates from a slight shock or sudden change of pressure, causing the pointer to oscillate on the dial, wearing out the delicate mechanism operating it, and rendering it difficult to ascertain the exact pressure to be indicated in use; and further, that the dip of such a spring causes it to retain a portion of the water condensed in it, rendering it liable, in cold weather, to burst or be strained by freezing. To overcome these defects several devices have been made use of from time to time, but they have invariably been subject to other grave defects, the more important being the setting or straightening of the springs employed, when acted upon by a pressure less than the maximum indicated upon the dial, so rendering the gauge inaccurate and worthless. To meet the need of those wanting a secure and reliable gauge, the Crosby Improved Bourdon Gauge was produced; the interior view being seen in cut Fig. 105 above. It originated from observations made of the motions of the free ends of the springs or tubes already in use, while under variable pressures. It was found that not only the horizontal motion of the springs could be utilized, which then was only employed in the gauges in use, but also that of the upward or perpendicular action of the same spring, if of a given length; and that by uniting these motions by proper mechanism it all could be transmitted to the pointer. This permitted and required firmer or stiffer springs for measuring like quantities of pressure than any before used. Experience has shown that under no circumstances of pressure employed within the amount indicated upon the dial, can they be straightened or their original elasticity affected. This device also avoids and prevents any vibration of the pointer under action; and the springs being held at their lowest points, and having no dip, allow the water to return to the siphon, thus removing the danger of freezing by extreme cold. While this gauge partakes of all the good qualities of the original Bourdon, the defects are carefully eliminated, and the use of springs one hundred per cent. stronger than can be used in any other style of gauge is permitted, so preventing its setting under any pressure that may be indicated upon its dial.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

COMBINATION ENGINE ROOM SET.

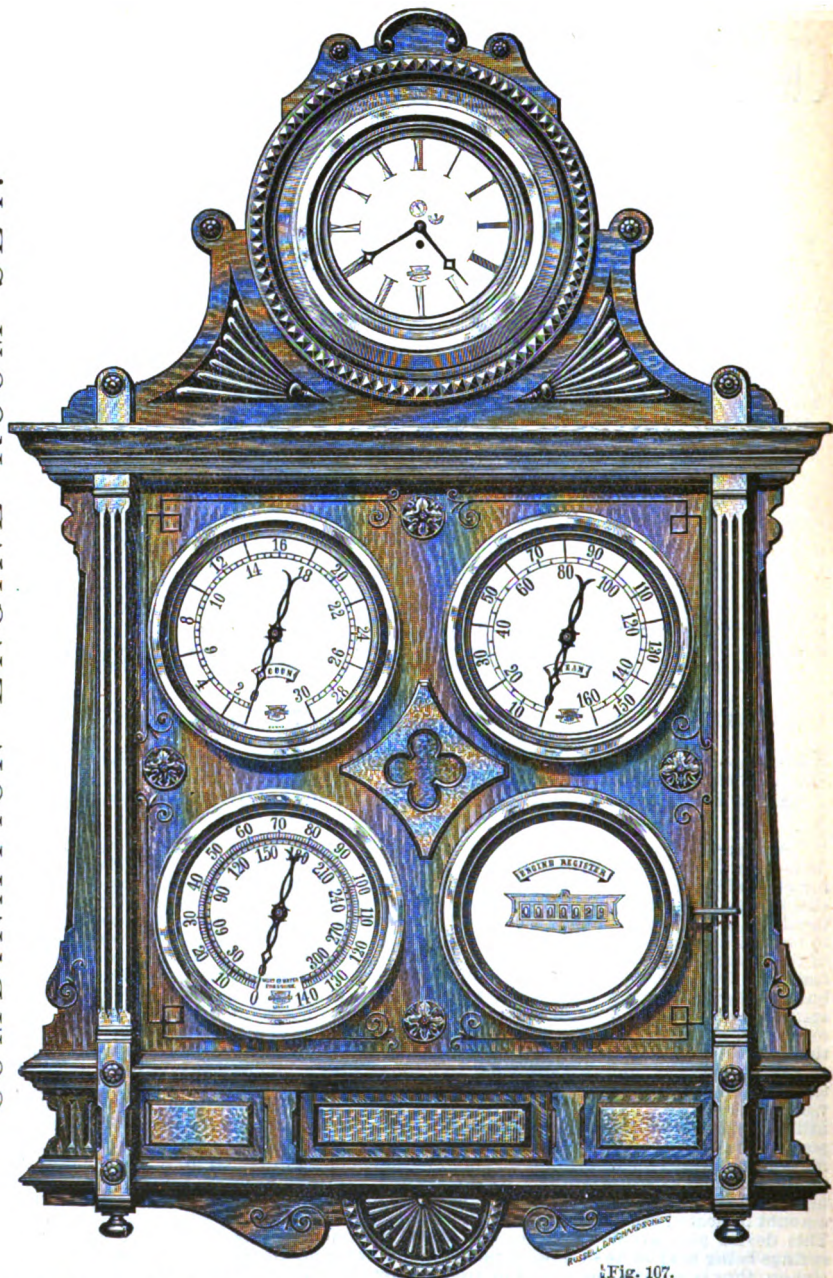


Fig. 107.

The above cut represents a set of instruments mounted in a handsome black walnut shield, especially designed for engine rooms. The set may be composed of five or less instruments of any size or style.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

COMBINATION PRESSURE AND VACUUM GAUGE.

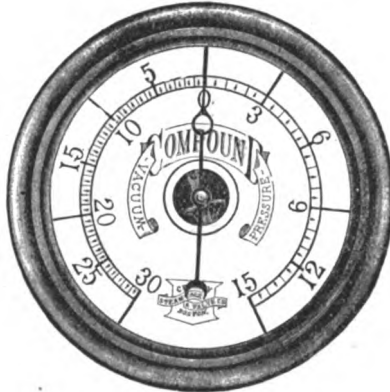


Fig. 108.

For indicating either pressure or vacuum as the case may be. It is graduated for pressure, in pounds per square inch, and for vacuum in inches of mercury in column or pounds per square inch, as may be desired.

Number, brass case,	1	2	3	5	6
" iron "	1½	2½	3½	4½	6½
Size of dial, inch,	8½	6½	6	5½	4½

HYDROSTATIC GAUGE.



Fig. 109.

To sustain with safety the enormous pressure to which these gauges are subjected, a hollow *steel* spring, bent in accordance to the Crosby Improved Pattern, hardened and carefully drawn to spring temper, is substituted for the ordinary gauge spring. In ordering, the maximum pressure to which they will be subjected should be stated, and if the tons on ram are required to be shown on a second graduated circle, the diameter of the piston of the press or ram should be also given. No extra charge for second circle. These gauges can be marked up as high as 20,000 lbs. pressure per square inch, and warranted to stand any pressure indicated upon the dial. They are sometimes termed Hydraulic Gauges.

Number, brass case,	1	2	8
" iron "	1½	2½	8½
Highest pressure, pounds,	10,000	10,000	6,000
Size of dial, inch,	8½	6½	6

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

COMBINATION GAUGE.

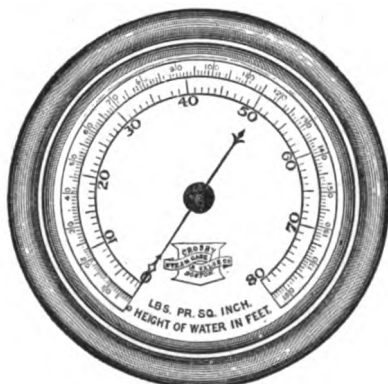


Fig. 110.

Number, brass case	0	1	2	3	4	5
Number, iron.....	0	1½	2½	3½	4½	5½
Size of dial, inches.....	10	8½	6½	6	5½	4½

For indicating pressure of water in pounds per square inch, and height of water in column in feet simultaneously, having two graduated circles on dial. It is designed for use on water service pipes, and needs no siphon.

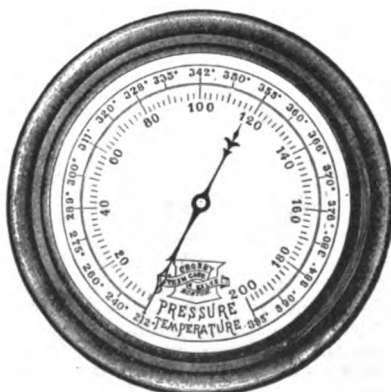
COMBINATION GAUGE,
FOR HEAT AND STEAM.

Fig. 111.

Number, brass case.....	0	1	2	3	4	5
Number, iron case	0	1½	2½	3½	4½	5½
Size of dial, inches	10	8½	6½	6	5½	4½

For indicating pressure of steam in pounds per square inch, also the heat of the steam in degrees at the same time. It is graduated in two circles.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

STANDARD TEST GAUGE.



Fig. 112.

These instruments are made with great care, and are tested and adjusted with the utmost precision by an open mercury column. The movements are highly finished, accurately adjusted, and work smoothly. The dials are graduated in one pound marks, and the whole instrument is fully warranted in every respect.

These Gauges are designed and adjusted to work with cold water pressure in connection with our Hydrostatic Test Pump. (See page 87.)

Number, brass case.....	0	1	2	3	4	5	6
Number, iron case		1½	2½	3½	4½	5½	6½
Size of dial, inches.....	10	8½	6½	6	5½	4½	3½

REVOLUTION COUNTER OR ENGINE REGISTER.



Fig. 113.

Each instrument is made with six wheels, which admits of registering one million. The mechanism is very simple and durable, as the parts most liable to wear are made of iron or steel. Each Register is fully warranted.

Size of dial.....	10	8½	6½ inches.
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All Brass Cases.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

MARINE AND LOCOMOTIVE CLOCKS.

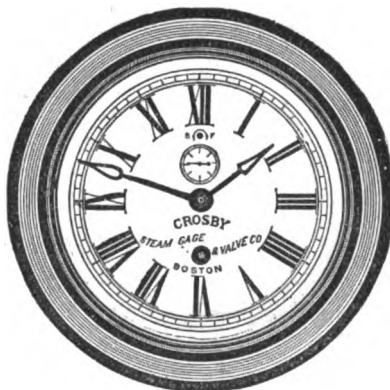


Fig. 114.

We manufacture these instruments in various sizes and with different grades of movement, such as the "Howard," "Thomas," "French," or the best common works, either eight day or thirty-six hours. The better class of movements are fitted with patent regulator and chronometer balance, full jeweled, and are finished in the best manner. We encase them in beautiful gold tinted metal cases, hinged ring and lock, or with nickel or silver plating, and furnish dials, either plain or elaborately engraved, to suit customers.

Size of dial..... 10 8½ 6½ 6 5½ inches.

IMPROVED PYROMETER.

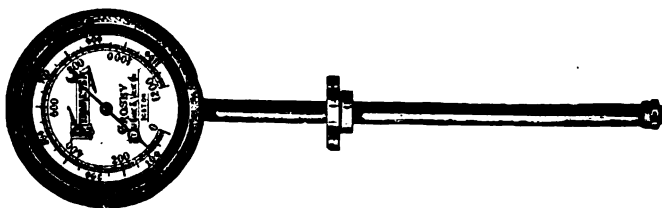


Fig. 115.

The stem is composed of two distinct pieces of different metals, and the difference in their expansion furnishes the motion for working the pointer when multiplied and transmitted by intermediate mechanism.

Adapted for blast furnaces, hot air pipes, superheated steam, varnish kettles, tempering ovens, bakers' ovens, drying and Japan ovens, oil and tar stills, galvanizing baths, wire annealing, chimneys, etc., etc.

This Pyrometer correctly indicates temperatures to 1200 degrees Fahrenheit by the expansion of its metallic stem. Each instrument is carefully graduated to a standard, and is fully warranted to the highest temperature marked upon its dial.

Size of dial..... 8½ 6½ 6 5 inches,

Either Brass or Iron Case.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

TEST PUMP.

FOR TESTING STEAM GAUGES.

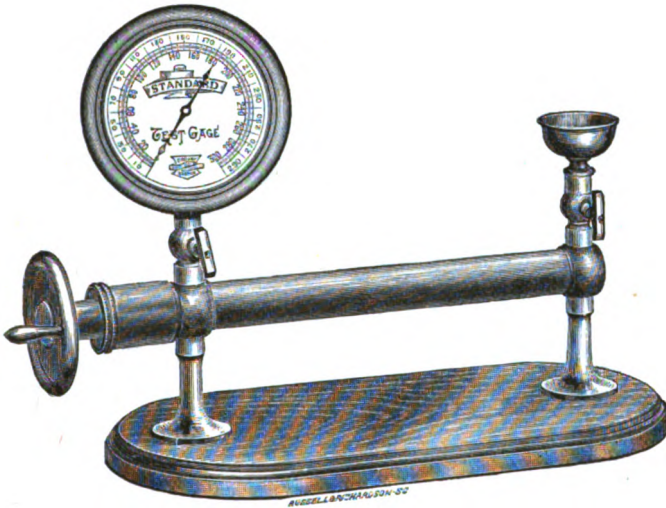


Fig. 116.

Also furnished without stand for the use of Inspectors.

BOILER TEST PUMP.

FOR TESTING BOILERS, PIPES, ETC., BY WATER PRESSURE.

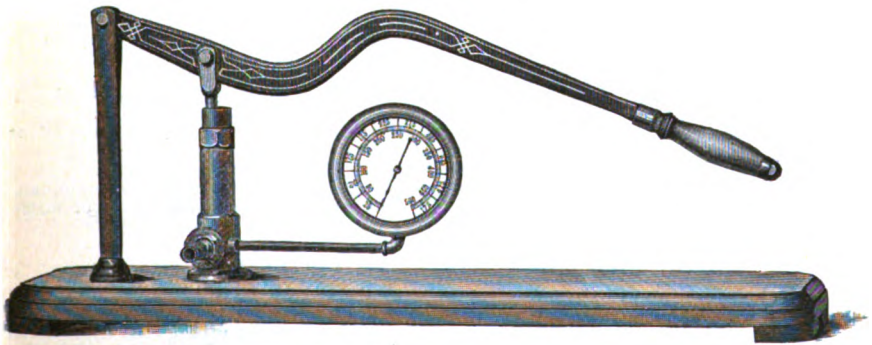


Fig. 117.

Price does not include gauge.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Crosby Steam Engine Indicator.

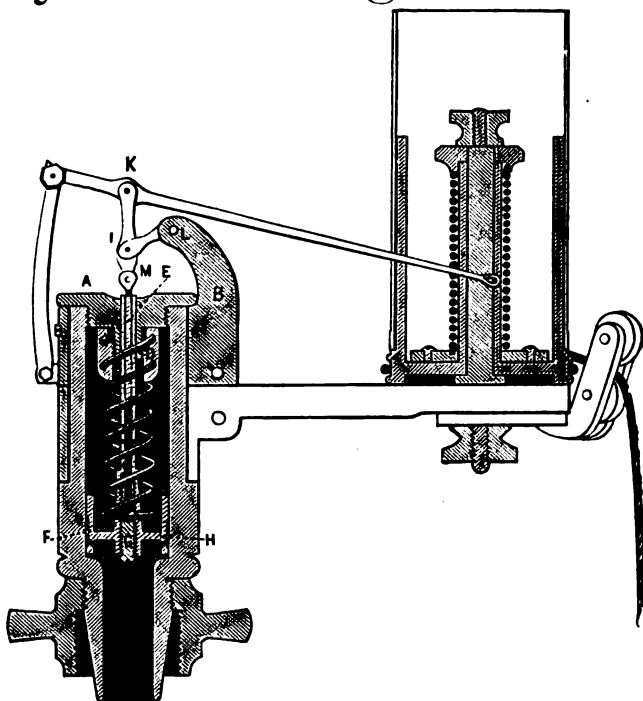


Fig. 118.

THE CROSBY STEAM ENGINE INDICATOR is designed for use on high speed engines, where other instruments have failed to give correct results.

The parallel motion used will give a straight, vertical line exactly at right angles with the atmospheric line.

The levers are as light as everyday use will permit, and every joint runs on hardened steel.

The spring is of a new design, which gives the least possible trouble from friction of the piston; its bearing is in the centre of the piston-rod, and on a ball and socket joint, which overcomes all tendency to twist the piston-head and cause friction. Every spring is carefully adjusted under steam test.

The piston-rod is solidly united to the piston-head, to serve as a guide.

The piston is provided with a system of steam chambers to prevent its contact with the cylinder.

The drum-spring is such as will give the most nearly constant strain on the cord at high speeds and can be adjusted to suit conditions.

A very handy stop is provided to adjust the pressure of the pencil on the paper.

The above-noted points will be recognized as valuable by engineers, and an examination of the instrument itself, or a test of its merits by use, will demonstrate its superiority over all other indicators now in use.

INDICATOR SPRINGS AND SCALES.

To adapt the indicator to any pressure, springs are made to the following scales:—

Nos. —8—12—16—20—30—40—50—60—80—100.

The number of the spring represents the pressure in pounds per square inch required to compress it sufficiently to move the pencil vertically one inch on the diagram, therefore, by dividing the boiler pressure in pounds by the desired height of diagram in inches, the result will be the number of the spring required. We recommend, not more than 2 inches movement of pencil. Every spring is adjusted and tested under steam pressure.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE KEYSTONE INJECTOR

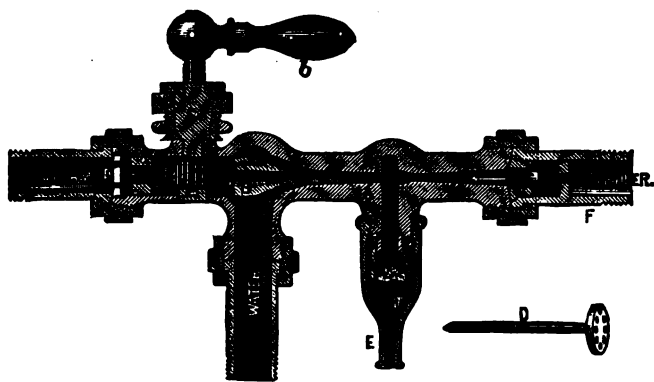


Fig. 119.

We claim for the Keystone Injector the following points of merit:

1st. Its simplicity, durability, and easy adjustment, requiring no skill to operate it.

2d. It is not affected by overheating, and will work under any pressure of steam from 5 lbs. to 160, and is not liable to break while working.

3d. It is void of all stuffing boxes. No extra fittings required for the two classes A and B.

4th. Its advantages over pumps. It is far cheaper. It is not necessary to run engine to fill boiler, as with engine or belt pumps. Thus saving fuel, repairs, oil, &c.

5th. The water by the use of this Injector is heated to 200° Fahrenheit, hence no heater is necessary, and can be dispensed with, although it will feed through a heater same as pump.

6th. It will raise water as high as any other make, and can be regulated to supply more or less water as the case requires.

7th. Will lift and work water as hot as any other Injector.

We are satisfied a trial will prove all we claim for our Injector. Call and see them in operation, or take one upon trial, and if it does not do all we claim for it, return it at our expense. Our Injectors are all tested before leaving the factory, and warranted. In ordering Injectors, be careful and state the class required, A or B; and if class B, give the height of lift, if possible. If in excess of what we claim, will try and make one to suit your wants.

TO DETERMINE SIZE OF INJECTORS REQUIRED.

One nominal horse-power requires one cubic foot of water per hour, or 7½ gallons. In cylinder boilers, divide the square feet of heating surface by 10, to obtain the horse-power. In flue boilers, divide by 12; and in multi-tubular by 15.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Dimensions of Keystone Injectors for Stationary Boilers.

Number.....	0	1	2	3	4	5	6	7	8	9	10	12
Size of pipe connections.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
Nominal horse-power at 70 lbs. pressure..	4	8	20	30	55	85	125	175	225	285	350	500
Number of gallons delivered per minute..	$\frac{1}{2}$	1	2	4	8	12	18	24	31	39	48	66

KEYSTONE LOCOMOTIVE INJECTORS.

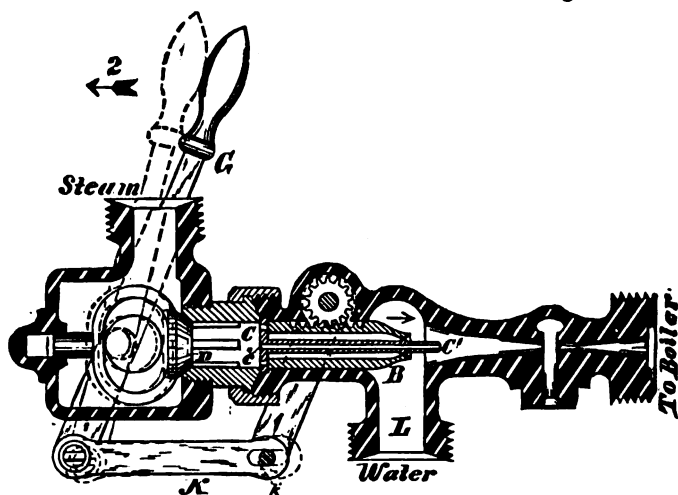


Fig. 120.

DESCRIPTION.

One motion of lever drafts the water, starts injector to work, and regulates the supply of steam and water for all pressures.

A reverse motion of lever stops injector.

With this injector steam can remain turned on at all times, as the starting and stopping is controlled solely by one lever. At steam pressure of 120 lbs. it will lift and work water at a temperature of 120° Fahrenheit.

This Injector should be placed inside the cab, within reach of engineer. By an arrangement at the overflow it can be used as a heater.

In ordering, state whether for right or left-hand side of engine; also state whether you use iron or copper pipes. We send, if not otherwise ordered with, swivels for copper pipes for steam and delivery to boiler, and water swivel for iron pipe.

DIMENSIONS.

Number.....	2	3	4	5	6	7	8	9	10	12
Size of pipe connections, inches..	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	3
Gallons per hour.....	150	375	660	1,050	1,425	1,800	2,340	3,000	3,570	4,875

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FOR PRICES SEE ACCOMPANYING LIST.

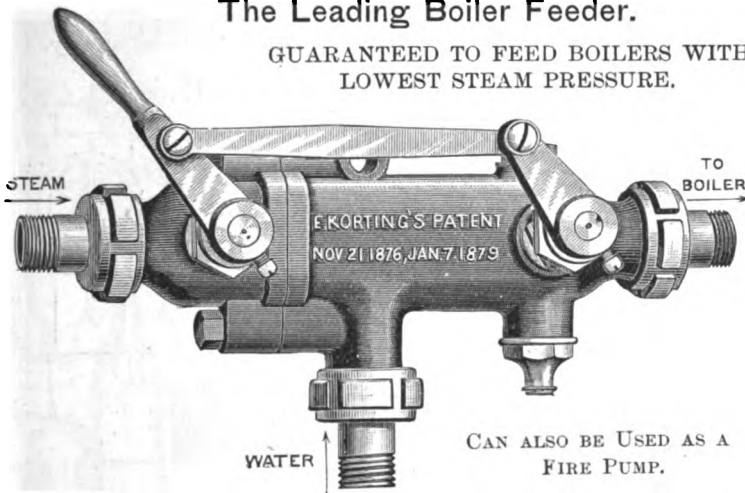
Korting Double Tube Injector.

The Leading Boiler Feeder.

GUARANTEED TO FEED BOILERS WITH
LOWEST STEAM PRESSURE.

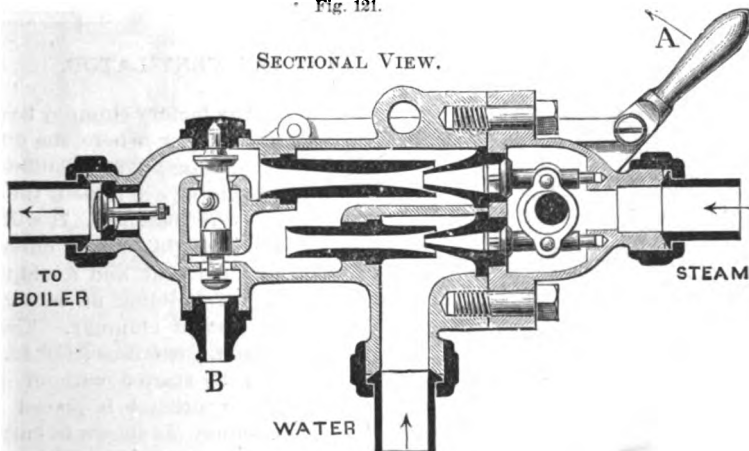
OPERATES BY ONE HANDLE.

DELIVERS HOT WATER.



CAN ALSO BE USED AS A
FIRE PUMP.

Fig. 121.



SECTIONAL VIEW.

Fig. 122.

This Injector being manipulated entirely with ONE HANDLE, obviates the necessity of any instruction to readily comprehend its operation.

In the position as shown in above cut, the Valves are closed ; by simply moving the Handle part way, the Steam Valve is opened, and as soon as water appears at Overflow B, push the Handle over as far as possible, and the Injector is working. There are no movable parts in its construction. Every machine is tested at factory, and is warranted in every particular.

Number.....	2	3	4	5	6	7	8	9	10	12
Size pipe connections ..	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Gallons per hour.....	120	282	504	600	825	1,185	1,500	1,875	2,325	3,450
Horse power.....	16	37	67	80	110	158	200	250	310	460

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

LIFTERS OR EJECTORS

FOR

Steam.

Delivery.

Conveying Water from Cellars,

ETC., ETC.,

TO ANY POINT IN UPPER PART OF

BUILDING.

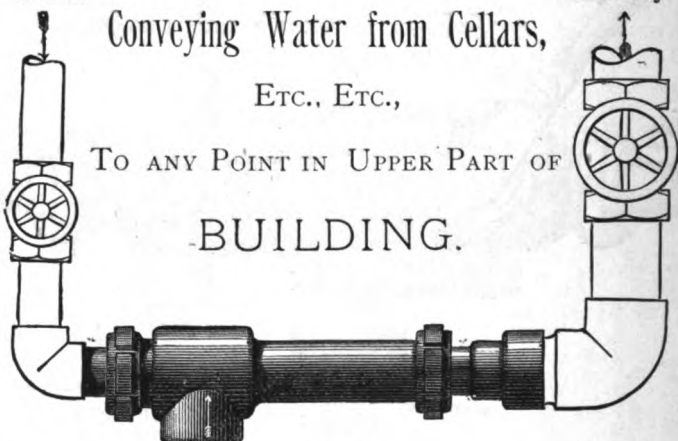


Fig. 123.

KORTING'S STEAM-JET CHIMNEY VENTILATOR.

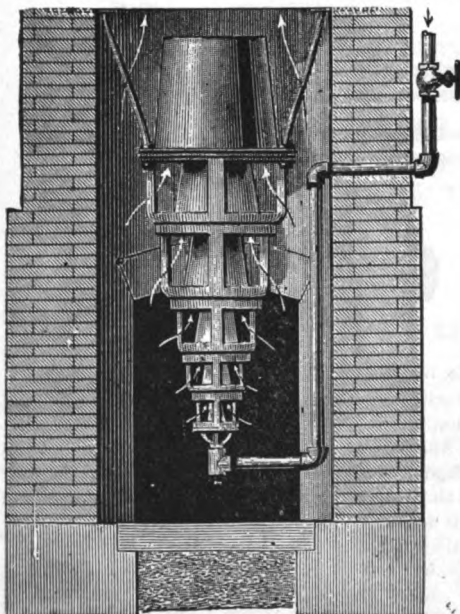


Fig. 124.

Any factory chimney having poor draught, or where the dimensions of chimney are insufficient, this ventilator will remedy the difficulty in every instance. It will increase the draught of any chimney over fifty per cent. and avoid the necessity of building an addition on top of present chimney. The area of chimney is not contracted, and fires can be started without difficulty. The ventilator is placed inside of chimney (as shown in cut) at lower end, and just above horizontal flue leading from Boiler furnace, and connected by steam pipe direct from Boiler, placing steam valve near ventilator. A small supply of steam will be sufficient to produce the most satisfactory results.

We, also, furnish an apparatus made on the same principle but arranged for blowing under the grate.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE HANCOCK INSPIRATOR.

CAPACITIES.

No.	SUCTION & FEED. INCHES.	STEAM INCHES.	GALLS. PER HOUR AT 60 LBS.
7½	¾	¾	60
8¾	½	¾	85
10	½	¾	120
12½	¾	½	220
15	¾	½	300
17½	1	¾	360
20	1	¾	540
22½	1¼	1	700
25	1¼	1	900
30	1½	1¼	1,260
35	1½	1¼	1,740
40	2	1½	2,280
45	2	1½	2,820
50	2½	2	3,480

LOCOMOTIVE INSPIRATOR. CAPACITIES.

No.	SUCTION & FEED. INCHES.	STEAM INCHES.	SIZE ENGINE.
10	¾	¾	Suitable for Narrow Gauge.
12½			
15			
17½	1	¾	12 to 14 in.
20			
22½			
25	1½	1¼	13 or 14 "
27½	1½	1¼	14 "
30	1½	1¼	15 "
32½	1½	1¼	16 "
35	1½	1¼	16 or 17 "
37½	1½	1¼	17 or 18 "
40	1½	1¼	18 "
			18 or 20 "

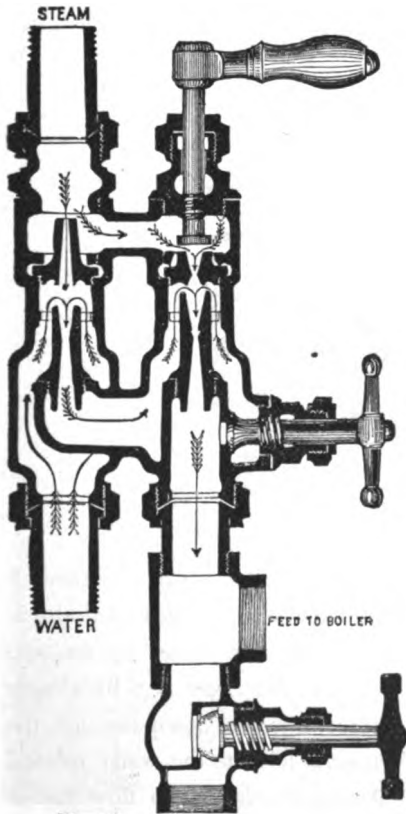


Fig. 125

OVERFLOW.

The capacities of Locomotive Inspirators are the same as stationary pattern.

THE "LITTLE WONDER" INJECTOR—Non-suction only.

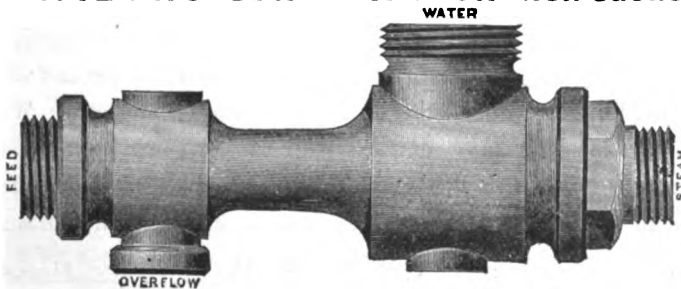


Fig. 126.

CAPACITIES.

Number.....	0	1	2	3	4	5	6	7	8	9	10
Steam and Suction, inches.....	1	1	1	1	1	1	1	1	1	1	1
Feed, inches.....	1	1	1	1	1	1	1	1	1	1	1
Gallons per hour at 60 lbs.....	50	100	200	300	500	700	850	950	1200	1500	1800

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FOR PRICES SEE ACCOMPANYING LIST.

THE DUPLEX INJECTOR.

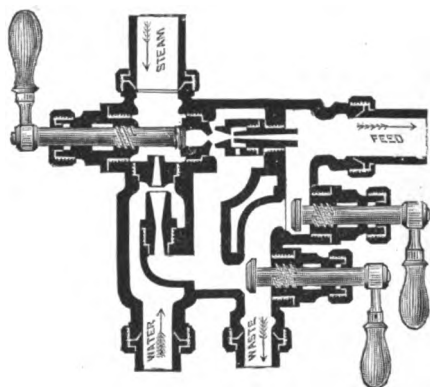


Fig. 127.

DESCRIPTION.

The above cut is a sectional view of the Duplex Injector, valve A closed, B and C open. The lifting Injector is the perpendicular, and the forcing Injector is the horizontal one. Steam let on from the steam pipe draws water up the suction pipe, and water flows through the valve B and to the overflow; by closing valve B water rises in the chamber up to the force Injector, down through the valve C to the overflow; by opening valve A, it gives force to the water moving through the force Injector and out through valve C, continuing to flow out of the waste or overflow; close valve C, and the Injector is forcing water to the boiler. This is the way, in practice, the Injector works. Every Injector is tested on short and long lift on high and low steam. If it does not work when sent out the fault can be looked for outside of the Injector. It is necessary that the suction pipe should be *absolutely air tight*; to test this, the lower end of the pipe can be stopped up, and close valves A, B and C, and let on steam; if the pipe is not tight the steam pressure will discover it. In long lifts or high lifts pipes one or two sizes larger than that given in the table for each size are recommended, as the friction on the pipes is less with large pipes than with small ones.

Number.....	3	3½	5	7	9	11	13	15	17	19	21	23	25
Size of suction and feed pipes.....	¾	¾	½	¾	¾	1	1¼	1½	1½	2	2	2½	3
Size of steam pipe.	¼	¼	¾	½	½	¾	1	1	1¼	1½	1½	2	2
Galls. per hour.....	65	90	130	240	320	560	960	1,280	1,760	2,260	2,860	3,480	4,620

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FOR PRICES SEE ACCOMPANYING LIST.

THE MONITOR INJECTOR.

CLASS C, NON-LIFTING.

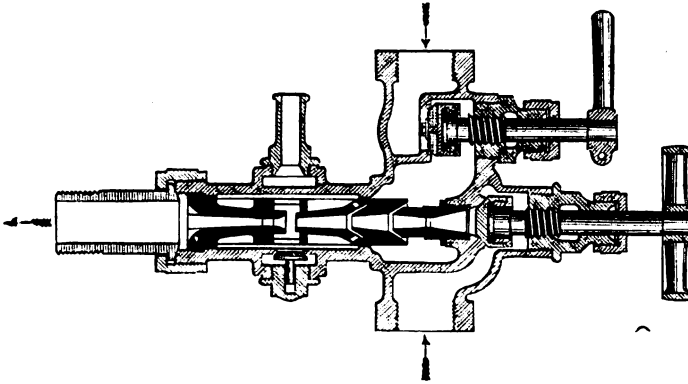


Fig. 128.

CLASS D, LIFTING.

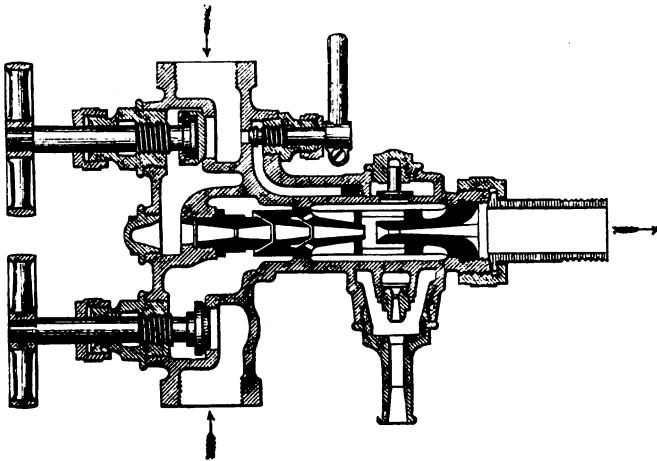


Fig. 129.

SIZES AND CAPACITIES.

Number.....	2	2½	3	4	5	6	7	8	9	10	12	14	16	18
Size pipe, inches.	½	¾	1	1¼	1½	1¾	2	2½	3	3½	4	4½	5	6
Capacity at 60 lbs. pressure, gallons.....	120	175	250	425	600	850	1,125	1,450	1,850	2,250	3,000	4,225	5,450	6,800
Capacity at 120 lbs. pressure, gallons.....	170	235	375	600	825	1,175	1,575	2,025	2,575	3,150	4,200	5,925	7,650	9,350

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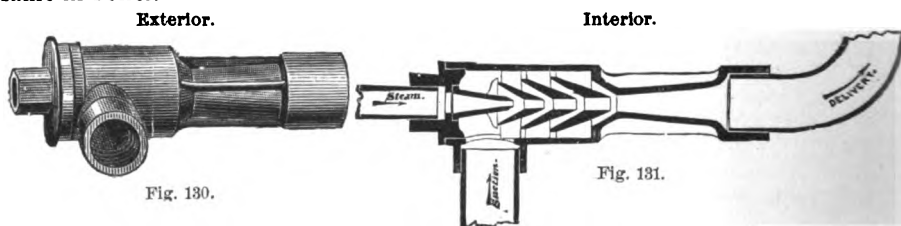
FOR PRICES SEE ACCOMPANYING LIST.

EJECTOR OR WATER ELEVATOR.

DESCRIPTION OF THE MONITOR INJECTOR.

Attention is called to the substantial make-up of these Injectors, in which the combination of strength and symmetry is well illustrated; also to the fact that they have attached to them steam valves and water cocks of best quality, which are usually separate, and charged extra on the price lists of other makers. For this reason considerable expense is spared in the fitting of them up. It will be seen by reference to the sectional cuts that the nozzles of these Injectors can be readily taken out for cleaning and repairs when necessary.

CLASS D—LIFTING, is applied only when water to feed Boilers is taken from rivers, ponds, reservoirs, wells, etc., where there is no head of water, and will raise water, according to steam pressure, from six to twenty-five feet and put same in boiler.



They are applicable in a great variety of forms for raising water and fluids from tanks, wells, ponds, mines, quarries, holds of vessels, docks, gas works, wheel pits and other receptacles too numerous to mention.

As a Bilge Pump these Ejectors have no equal.

These Ejectors are very compact in shape and do not occupy much space, and hence may be placed at little expense near the work to be done, which would be impossible in many instances with steam pumps or other pumping appliances. They have another advantage in being portable, and capable of being moved readily with little trouble from place to place, which is a very desirable feature where the duty they are required to do is not of a stationary character.

SIZES AND CAPACITIES.

Number	000	00	0	1	2	3	4	5	6
Delivery per hour in } Gallons at 45 lbs. } steam pressure. . . }	250	500	900	1,200	2,000	3,000	5,000	8,000	10,000
Diameter of Steam } Pipe in inches . . . }	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2
Diameter of Deliv- } ery Pipe in inches. }	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	3	4
Diameter of Suction } Pipe in inches. . . }	$\frac{1}{2}$	1	$1\frac{1}{2}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$2\frac{1}{2}$	3	4
Boiler Capacity, } Horse Power. . . }	3 to 4	3 to 4	3 to 4	5 to 6	7 to 8	10 to 15	25	35	45

At 80 lbs. steam pressure the Ejector will throw 50 per cent. more water.

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FOR PRICES SEE ACCOMPANYING LIST.

HAWES' PATENT STEAM TRAP.

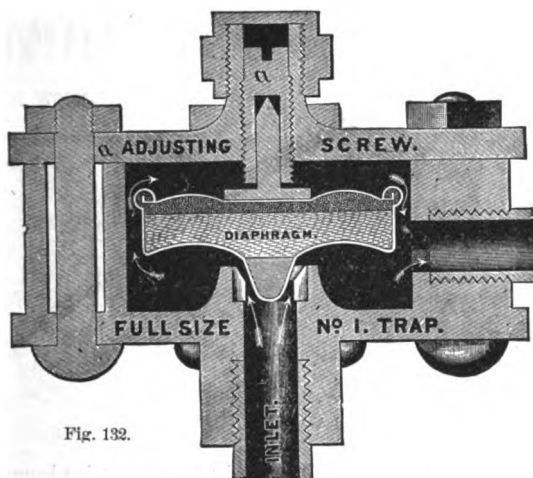


Fig. 132.

This Trap is warranted to discharge condensation under any pressure less than 150 lbs. and deliver the water from 140 to 212°, with no loss of steam. Large size occupies six inches, and can be applied wherever condensation occurs. It is a safeguard against water freezing in pipes, as it is always open when cold. Circulation is absolute. No snapping noise of pipes. The monthly saving is more than cost of Trap. For steam engines having long line of pipe, they are all that can be desired to give dry steam. Water can be elevated from 5 to 100 feet.

Number	1	2	3	4	5	6
Size of pipe connection, in.	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Feet of 1 inch pipe drained,	500	1,000	2,000	4,000	10,000	15,000

NASON'S PATENT STEAM TRAP.

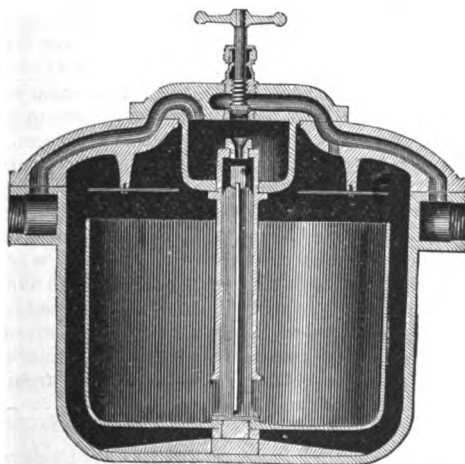


Fig. 133.

Number	1	2	3	4	5
Size of pipe connections	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$
Sqr. feet of surface suitable for	350	900	1,400	2,000	3,500

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FOR PRICES SEE ACCOMPANYING LIST

WELDON'S LOW WATER ALARM.

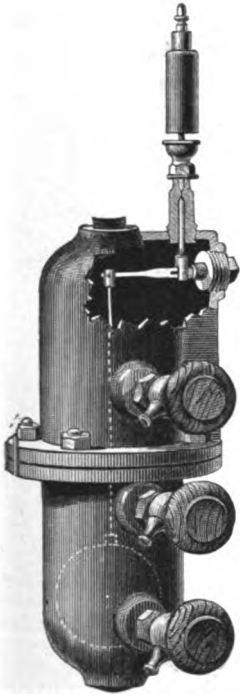


Fig. 186.

**ALARM WITHOUT WATER
GAUGE OR FITTINGS.**

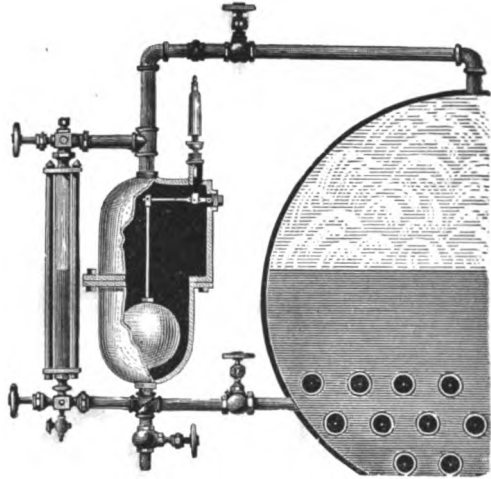


Fig. 187.

**ALARM WITH WATER GAUGE, GAUGE COCKS AND
FITTINGS ATTACHED TO BOILER.**

This invention consists of a hardened float, and the arrangement of a lever, valve and fulcrum in such a manner that it is impossible for it, under any circumstances, to bind, stick, corrode or get out of order. Pronounced by those best posted in alarm water gauges to be absolutely perfect.

It is so arranged that, should the water supply be shut off, the pump or injector get out of order, the boiler spring a leak, or should the water in the boiler, from any other cause, get down to the lowest gauge-cock, or down to whatever point the valve is set, the steam whistle will commence, and continue to blow until the water is put into the boiler. It will indicate at all times the exact height of solid water in the boiler, regardless of foam; so, with this protection, the boiler can never be injured or exploded on account of low water.

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HOTCHKISS MECHANICAL BOILER CLEANER.

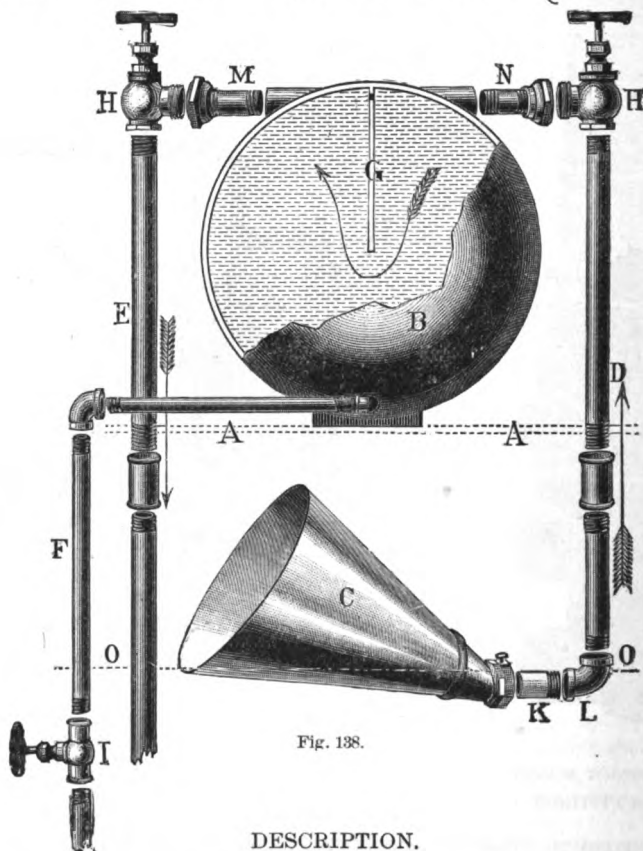


Fig. 138.

DESCRIPTION.

In the cut the double dotted line AA is the top of boiler shell, upon which the *reservoir* B rests; this *reservoir* is connected with the *funnel* C, by the *up-flow pipe* D, and to a lower part of the water in the boiler by the *return pipe* E; this completes the circulation which flows in the direction shown by the arrows. The *funnel* C is set within the boiler on the **low water** line, as indicated by the dotted line OO. G is a diaphragm in the *reservoir* to obstruct the flow of water therein, prevent agitation of the contents, and insure a still place for the precipitation of sediments. F is the *blow-off pipe* for removing the deposits from the *reservoir*. HH are two valves used to shut off *reservoir* from boiler in case of leakage. Angle valves as shown are generally used to simplify the connections. I is a valve on *blow-off pipe* F. K is a right and left threaded nipple to make joint between *funnel* C and elbow L on bottom of *up-flow pipe* D. M and N are nipples, each with half union, to make joints with valves H H.

All pipes and fittings are 1½ inch except the *blow-off pipe*, for which 1 inch pipe and fittings are used.

The *blow-off pipe* may be carried to any desired place as occasion requires.

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FOR PRICES SEE ACCOMPANYING LIST.

THE "SPRAY" FEED-WATER PURIFIER AND HEATER.

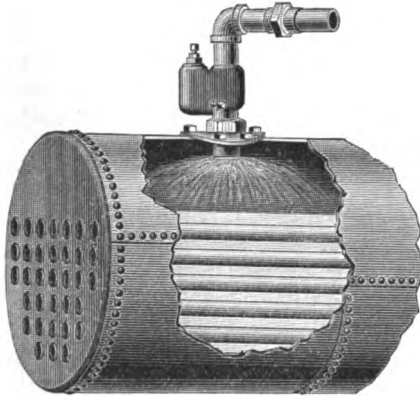


Fig. 189.

DESCRIPTION.

In the use of this device, the water is forced (as usual by a pump or injector) and enters the steam space of the boiler in the form of spray, where it is instantly heated to the boiling point. A complete separation of all the impurities which the water may have contained in solution or suspension is thus made, and in falling through the steam to the surface at the "water line," assume a minute granular form. This sediment is carried by the hot circulating current toward the cooler part of the boiler, and, there settling, can be blown off. In order to prevent accumulation, it is only necessary to open the blow-off valve during the daily use of the boiler occasionally. Two or three times during ten or twelve hours' run is in most instances sufficient to remove all sediment, it having been found impossible for scale to form upon the shell or tubes of a boiler using the "Spray" Feed-Water Purifier.

Boilers that have been coated heavily with scale are now kept clean. All the old incrustations will fall off mechanically, as there is no new deposit continually forming to cement it to the shell and tubes, as is the case when boilers are supplied with water in volume.

The instrument is made of the best steam metal, will not corrode, and its successful use has clearly proven that it does not get out of order, or fail from any cause. The leading feature of the device is the valve, which controls the entrance of the water, and, assisted by the high steam pressure in the boiler, forms the spray. Our letters patent cover the use of any practical form of valve inside a boiler for the purpose.

AN IMPORTANT SAVING

in boiler repairs is effected by using the "Spray" Purifier, as the water entering the boiler by this device does not come in contact with the shell or tubes until it is heated as hot as that at the "water line," rendering cold currents impossible, lessening the liability to explosion, and "shell cracks" are entirely avoided.

Sizes, $\frac{3}{4}$ 1 $1\frac{1}{2}$ 2 inch.

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FOR PRICES SEE ACCOMPANYING LIST.

THE BARAGWANATH Steam-Jacket Feed-Water Heater and Purifier.

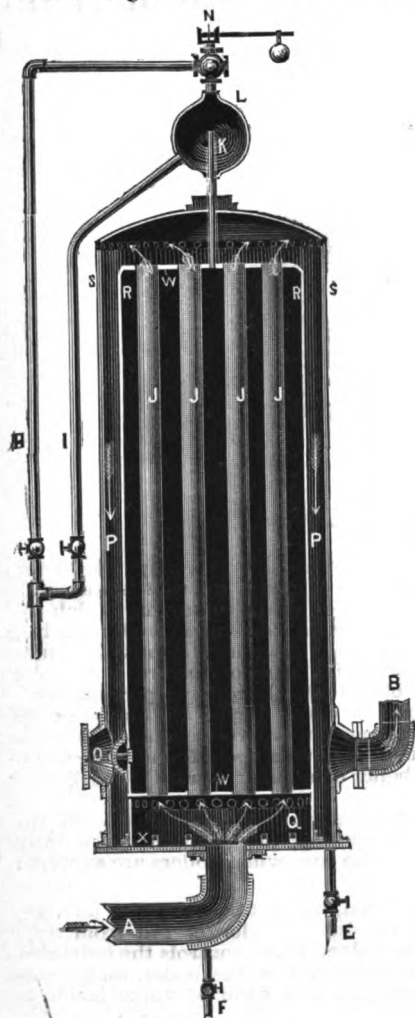


Fig. B

Fig. 140.

The water is forced into heater at feed pipe C, and leaves the heater at D. O represents hand plate, L scum chamber, K pipe for connecting scum chamber with heater, and N safety valve.

When water in heater boils, the impurities rise to scum chamber, the lighter or gummy body remains on top and is blown off from pipe H. Some matter is precipitated in scum chamber and is blown off through pipe I.

EF Drip pipes for draining water of condensation from heater.

S
H
E
E
T

No.	Horse Power of Boiler.	Diameter of Heater.	Length of Body of Heater.	Height of Heater to top of scum chamber when set up.	Diameter of Exhaust Port.
0	15	16 in.	60 in.	88 in.	3½ in.
1	25	16 "	70 "	98 "	4 "
2	40	20 "	72 "	100 "	5 "
3	60	20 "	85 "	113 "	6 "
4	80	24 "	87 "	115 "	7 "
5	110	24 "	108 "	136 "	7 "
6	150	24 "	132 "	178 "	8 "
7	175	29 "	132 "	180 "	8 "
8	250	36 "	134 "	192 "	10 "
9	375	40 "	136 "	184 "	12 "
10	500	40 "	160 "	208 "	14 "

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FOR PRICES SEE ACCOMPANYING LIST. 1

DESCRIPTION OF

The Baragwanath Heater and Purifier.

The Steam Jacket Heater is a non-radiator, as no part of its water chamber is in contact with the open air. The exhaust steam passes up its internal tubes, and down around the external side of its water chamber; thus the apparatus has a greater amount of heating surface than can be obtained from any other heater of the same capacity. Being in contact with exhaust steam only, the water in the heater is made as hot as the exhaust steam, which we find to be usually several degrees above boiling.

Other heaters have their exterior surface exposed to and in contact with the open air causing a large percentage of heat to be lost by radiation. Our Steam Jacket not only avoids this loss, but actually converts the whole of the shell into heating surface. Consequently, it will deliver the water into the boiler many degrees hotter than any other heater, and as the water does not have to pass through a pump after leaving the heater, it does not lose its heat by the process of pumping.

The Steam Jacket Heater is, properly speaking, a Boiler, because it invariably boils the feed-water and delivers it into the boiler above boiling point—the boilers thus fed are simply steam generators.

Some of the advantages to be derived from the use of this Heater are as follows :

That it delivers its feed-water as hot as the exhaust steam. Exhaust steam from a well-constructed and economical high pressure engine is above 212 degrees Fah., so the Heater delivers its water above 212 degrees Fah.

Where back pressure exists this Heater reduces it, because it acts as a surface condenser.

The form of this Heater is cylindrical, the tubes acting as braces from head to head. It is the strongest form known, and hence the safest under very high pressure.

The flues and shell are made of the same material and subject to the same temperature, hence they expand and contract equally, thus relieving the tube ends of the strains so damaging to common heaters.

The exhaust steam from any high pressure steam pump or engine, when passed through this Heater, will boil five times as much water as is required to supply that pump or engine with steam. This is important to hotels, factories, packing-houses, breweries, and all establishments using large quantities of hot water.

Boiling is the essential condition to purifying. The Steam Jacket Heater is the only heater that delivers its water at boiling point by exhaust steam, hence it is the only purifier.

The water is forced through this Heater when, at a low temperature, thus dispensing with the expense and trouble inseparable from the use of a hot water pump.

Only one pump, injector or inspirator is required in connection with this Heater.

The construction and operation of the heater is so simple that little or no attention is required except to blowing off, which is necessary to expel the impurities, and keep the boiler clean.

Every Heater is made of the best materials, tested and warranted.

We guarantee every Heater to do all we claim for it.

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FOR PRICES SEE ACCOMPANYING LIST.

Strong's Feed-Water Heater, Filter and Purifier.

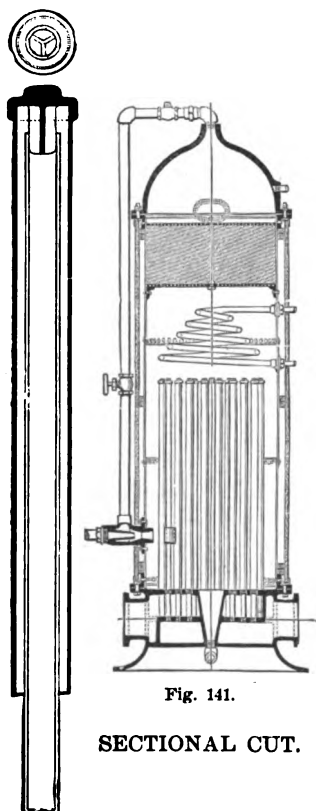


Fig. 141.

SECTIONAL CUT.

The claim made for Strong's Patent Feed-Water Heater and Purifier is, that the water is HEATED TO THE PRECIPITATING POINT, causing a CHEMICAL separation. In accomplishing this result, exhaust steam, that would otherwise be wasted, is used up to 208° to 212°, when the temperature is increased to the precipitating point by the use of a live steam coil. The water is then filtered, as a last step, by passing it through wood charcoal, or any other suitable material, for the purpose of causing a complete MECHANICAL separation. The system of brass tubes for the exhaust steam, as shown in lower part of cut, is so arranged as to permit perfect freedom of contraction and expansion and to cause a rapid and thorough circulation. The water being fed at the side of the heater, near the bottom, comes in contact with the tubes and is heated. The earthy matter is allowed to settle on the bottom, while the warm water rises. When the water has reached the top of the tubes, it obtains a temperature of from 208° to 212° Fahr., according to the point of cut-off and pressure of steam. This temperature is sufficient to cause precipitation of most mineral deposits, except the sulphates and carbonates. When these are present in water, the coil shown on the central portion of the cut, through which live steam circulates, causes a rise of temperature almost equal to that in the boiler, after which the water is passed through a filter composed of packed charcoal, held between cast iron plates well fastened together, leaving a deposit of minerals in the lower portion of the filter. The water then passes out at the side of the dome into the steam space of the boiler. The dome is shaped to gather any scum that might arise at the highest point, from which it is pumped back to the bottom by the incoming jet of feed-water—by the ejector connecting the circulating pipe with the bottom.

LIST OF SIZES AND CAPACITIES.

Size.	Dimensions.	Size of Exhaust.	Capacity per Hour.	Horse-Power.
A.	12 in. by 8 ft.	3 inches.	187 gallons.	25 to 50
B.	18 " 10 "	4 "	282 "	50 " 75
C.	24 " 12 "	6 "	564 "	75 " 150
D.	30 " 14 "	8 "	939 "	150 " 250
E.	36 " 18 "	10 "	1,500 "	250 " 400
F.	42 " 18 "	12 "	2,250 "	400 " 600
G.	48 " 18 "	14 "	3,000 "	600 " 800
G. Ex.	48 " 20 "	14 "	3,750 "	800 " 1000

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FOR PRICES SEE ACCOMPANYING LIST.

The Nason's Improved Feed-Water Heater.

CAST IRON, WITH WROUGHT IRON COIL.

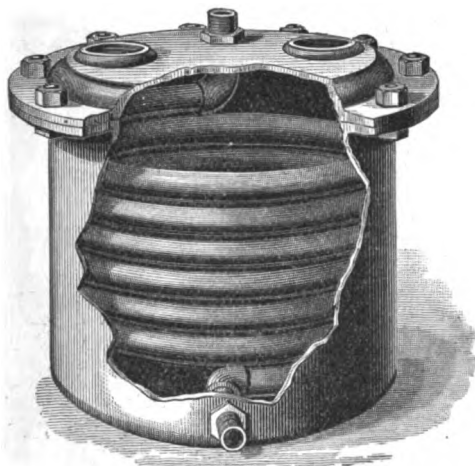


Fig. 142.

Size of Pipe.....	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Diameter of Cylinder, inches.....	$12\frac{1}{4}$	$14\frac{1}{4}$	$16\frac{1}{4}$	$20\frac{1}{4}$	24
Height of Cylinder, ".....	12	14	$16\frac{1}{4}$	20	24
Feet of Pipe in Coil, ".....	15	17	24	35	46

IMPROVED DAMPER REGULATOR.

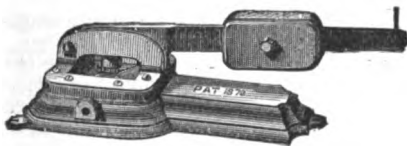


Fig. 143.

Number.....	2	3	4	5
Largest Boiler suitable for, horse power.....	4	20	50	50 and over.

DESCRIPTION.

The operation of the machine is as simple as its construction. The rubber diaphragm is protected by triangular, flat metal plates, hung on knife edges, which communicate motion to the lever; this makes the machine

SENSITIVE TO THE SLIGHTEST VARIATION OF PRESSURE,

and at the same time the diaphragm is relieved of any undue strain whatever through its extremes of motion.

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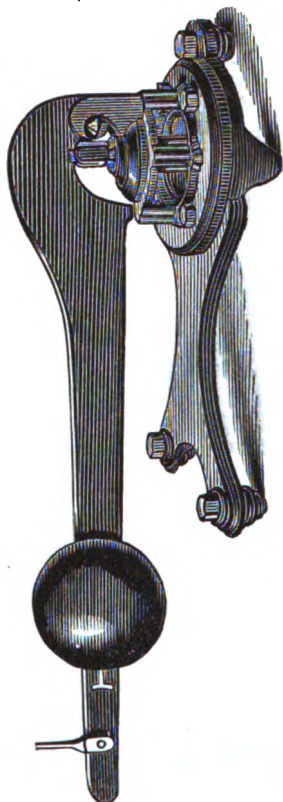
CLARK'S DAMPER
REGULATOR.

Fig. 144.

Number	Size of Boiler suitable for
1	5 horse and less.
2	10 to 20 horse
3	30 to 500 "
4	Low Pressure.

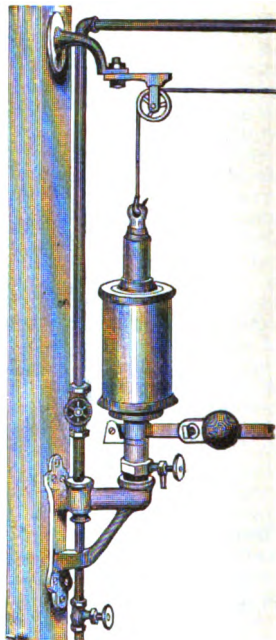
KELLAM'S PATENT
Damper Regulator.

Fig. 145.

Its working is as precise and sure as machinery can possibly be made, and being made entirely of STEAM METAL, with no Rubber, Leather or other soft packing, there is nothing to wear out or get out of order. Its construction is such that it can be located at any point, and by the mode of its operation, will control two or three separate dampers at different angles within any reasonable distance. A written guarantee for five years is given with every Regulator. It will save from 10 to 25 per cent. of fuel, depending upon the amount of boiler and fire surface. All exposed parts being fully nickel plated, in addition to its perfect working, is an ornament to any boiler or engine room.

SIZES :

Number.....	1	2	3	4
Size of Damper suitable for, inches,	18x24,	40x40,	40x40,	very large
	High	Low	High or	
	Pressure,	Pressure,	Low Pres.	

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FOR PRICES SEE ACCOMPANYING LIST.

OIL CUPS.

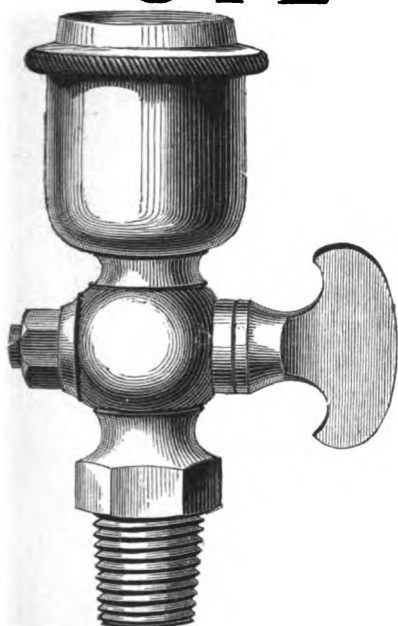


Fig. 146.

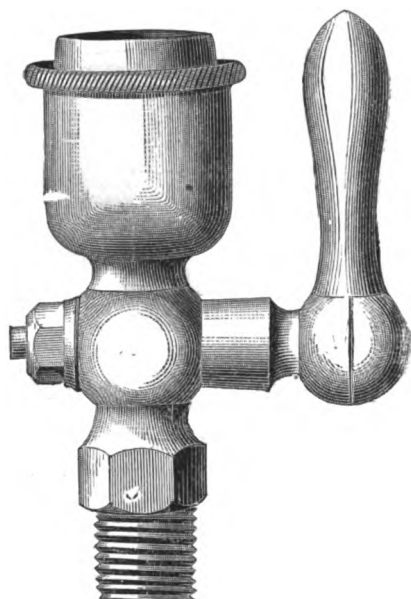


Fig. 147.

Number.....	8	9	10	11	12	12½	13	13½	14	15	16	17	17½	18
Size Pipe Thread, in. . .	½	¾	1	1¼	1½	1¾	2	2½	2½	3	3½	4	4½	5
Diam. of Bowl, in. . .	1	1¼	1½	1¾	2	2½	2¾	3	3½	4	4½	5	5½	6



Fig. 148.

Number.....	23	23½	24	25	26	27	28	29	30	31
Size Pipe Thread, in. . .	½	¾	1	1¼	1½	1¾	2	2½	2¾	3
Diam. of Bowl, in. . .	1	1¼	1½	1¾	2	2½	2¾	3	3½	4

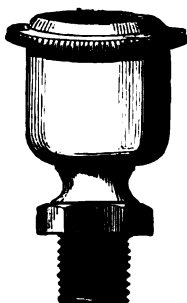


Fig. 149.

Number.....	31½	32	33	34	35	36	37	38	39	40
Size of Pipe Thread, in. .	½	¾	1	1¼	1½	1¾	2	2½	2¾	3
Diam. of Bowl, in. . .	1	1¼	1½	1¾	2	2½	2¾	3	3½	4

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BROUGHTON'S PATENT
TRANSPARENT OIL CUP.

PLAIN OIL CUP.

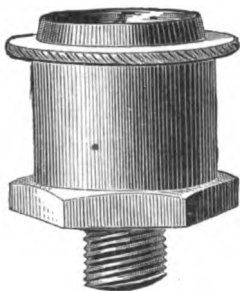


Fig. 150.

Number	19	20	21	21½
Size Pipe Thread, in..	⅛	¼	¼	⅜
Diam. Bowl, in.....	1	1½	1⅞	1½



Fig. 151.

Number.....	0	1	2	3
Size pipe thread, in. ¼	⅛	⅜	¾	½
Diam. of glass, in. 1⅞	1⅞	1⅞	2	2½

GEE'S PATENT OIL CUPS.



Fig. 152.

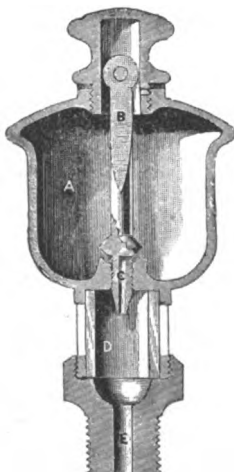


Fig. 153.

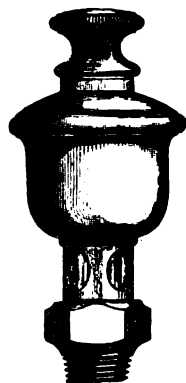


Fig. 154.

Number.....	0	1	2	3	4	5
Size of pipe thread, inch, ¼	⅛	⅜	½	½	½	¾
Diam. of bowl, inch, 1⅞	1⅞	1½	2	2¼	2¾	3¼

Same sizes as above, made with glass case.

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FOR PRICES SEE ACCOMPANYING LIST.

THE DREW PATENT OILER.



Fig. 155.

Globe pattern, for Shafting.

Number.....	2	3
Diam. of glass.....	2½	3 in.

Extra heavy Globe Cups for Engines.

Number.....	2	3	4
Diam. of glass.....	2½	3	4 in.



Fig. 156.

Straight pattern, for Engines.

0	1	2	3	4	5
1½	1½	1½	2½	2	3 in.

No. 0 is especially adapted to portable engines. No. 4 is especially adapted to locomotives.

All of above Cups nickel plated unless otherwise ordered.

SIGHT FEED OIL CUPS.

GLASS CUPS.

Number.	Capacity.	Height.
1	1½ oz.	4 in.
2	2½ oz.	4½ in.
3	3½ oz.	5 in.
4	7½ oz.	7 in.

BRASS CUPS.

Number.	Capacity.	Height.
4	1½ oz.	3 in.
3	2½ oz.	3½ in.
2	3½ oz.	4 in.
1	7½ oz.	6 in.



Fig. 157.

Nickel Plating extra.

CLASSES.

Class A has glass case, fixed cover, automatic stem.

Class C has glass case, loose cover, automatic stem.

Class E has glass case, loose cover.

Class G has glass case, fixed cover.

Class H has brass case, loose cover.

Class N has brass case, fixed cover.

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FOR PRICES SEE ACCOMPANYING LIST.

DREYFUS'
PATENT
Self-Acting Oilers
FOR
Shafting and Engines.

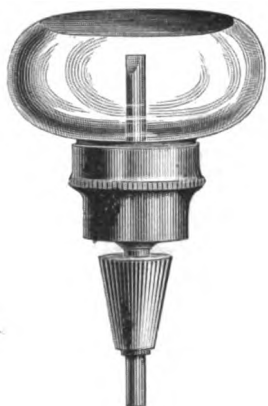


Fig. 158.—No. 9.



Fig. 159.—No. 12, W. B.



Fig. 160.—A to D.

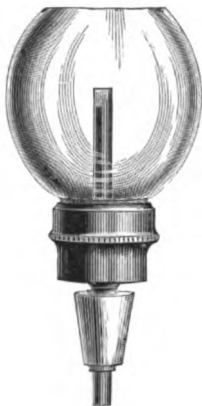


Fig. 161.—No. 10.

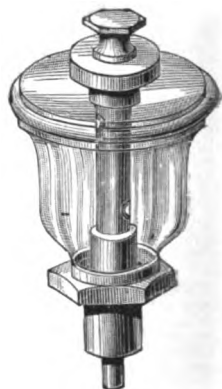


Fig. 162.—No. 24 to 26.



Fig. 163.—No. 20 to 100.



Fig. 164.—No. 15 to 22.



Fig. 165.—No. 30 to 150.

A saving of from 50 to 75 per cent. guaranteed.

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FOR PRICES SEE ACCOMPANYING LIST.

Sizes and Capacities of Dreyfus' Oilers.

No.		Capacity.	Diameter.	Height.
No. 000.	—For Cards, Looms, Lathes or for small Journals.....	$\frac{3}{4}$ oz.	$1\frac{1}{2}$ in.	$2\frac{1}{2}$ in.
" 00.	—For Cards, Looms, Lathes or small Journals.....	1 "	$2\frac{1}{4}$ "	$2\frac{1}{2}$ "
" 0.	—For Card Cylinders, Strippers and Compact Connections....	$\frac{3}{4}$ "	$1\frac{1}{8}$ "	$2\frac{1}{2}$ "
" 3.	—For Card Cylinders, Strippers and Compact Connections, to fill from top.....	$\frac{3}{4}$ "	$1\frac{1}{8}$ "	$2\frac{1}{8}$ "
" 9.	—For Shaftings, Pickers, Looms and Fans.....	$1\frac{1}{2}$ "	$2\frac{1}{2}$ "	$3\frac{1}{4}$ "
" 9.	—W. B. for Compact Shaftings or Connections.....	$1\frac{1}{2}$ "	$1\frac{3}{4}$ "	$3\frac{1}{4}$ "
" 10.	—For Shaftings, Pickers, Looms and Fans.....	$3\frac{1}{2}$ "	$2\frac{1}{4}$ "	$4\frac{1}{4}$ "
" 10.	—W. B. for compact shaftings or connections.....	3 "	2 "	$4\frac{1}{2}$ "
" 11.	—For shaftings or connections where the cups are required to be screwed in.....	$1\frac{1}{2}$ "	$2\frac{1}{2}$ "	$3\frac{1}{4}$ "
" 12.	—For same use as No. 11.....	$3\frac{1}{2}$ "	$2\frac{1}{4}$ "	$4\frac{1}{2}$ "
" 13.	—To fill from top.....	$1\frac{1}{2}$ "	$2\frac{1}{2}$ "	$3\frac{1}{4}$ "
" 13.	—W. B., ditto.....	$1\frac{1}{2}$ "	$1\frac{3}{4}$ "	$3\frac{1}{2}$ "
" 14.	—ditto.....	$3\frac{1}{2}$ "	$2\frac{3}{8}$ "	4 "
" 15.	—For Engines or Connections, ditto.....	$3\frac{1}{2}$ "	$2\frac{3}{8}$ "	4 "
" 16.	—For small Connections, ditto.....	$\frac{3}{4}$ "	$1\frac{3}{8}$ "	2 "
" 18.	—For Upright Shaftings.....	$3\frac{1}{2}$ "	$2\frac{3}{8}$ "	$4\frac{1}{2}$ "
" 22.	—For small Engines or Lathes.....	$\frac{3}{4}$ "	$1\frac{1}{2}$ "	$2\frac{1}{8}$ "
" 23.	—For Fast-running, ditto.....	$\frac{1}{8}$ "	$1\frac{1}{4}$ "	$1\frac{1}{8}$ "
" 24.	—For Engines.....	$2\frac{1}{4}$ "	$2\frac{1}{4}$ "	$3\frac{3}{8}$ "
" 25.	—For Heavy Bearings or Pillow Blocks.....	8 "	3 "	6 "
" 26.	—For Small Engines.....	$\frac{3}{4}$ "	$1\frac{1}{4}$ "	$2\frac{1}{4}$ "

ENGINE CUPS—SKELETON.

No.		Capacity.	Diameter.	Height.
No. 30.	.....	$\frac{1}{4}$ oz.	$1\frac{3}{4}$ in.	$2\frac{1}{2}$ n.
" 40.	.....	1 "	$2\frac{1}{4}$ "	$3\frac{1}{2}$ "
" 48.	.....	$1\frac{1}{4}$ "	$2\frac{3}{8}$ "	$3\frac{3}{4}$ "
" 54.	.....	1 "	$2\frac{1}{4}$ "	$3\frac{3}{8}$ "
" 60.	.....	$1\frac{1}{4}$ "	$2\frac{1}{2}$ "	$3\frac{3}{4}$ "
" 72.	.....	2 "	$2\frac{3}{4}$ "	$4\frac{1}{2}$ "
" 76.	.....	$4\frac{1}{2}$ "	$3\frac{3}{8}$ "	$5\frac{1}{2}$ "
" 80.	.....	8 "	$3\frac{3}{4}$ "	$5\frac{1}{2}$ "
" 90.	.....	14 "	5 "	$7\frac{1}{4}$ "
" 150.	.....	3 pts.	$6\frac{1}{4}$ "	$8\frac{1}{2}$ "
" 32.	—Iron Mounted.....	8 oz.	$4\frac{1}{2}$ "	6 "

Crank-pin Cups for Upright Engines to order.

A.....	$\frac{3}{8}$ "	$1\frac{1}{8}$ "	$2\frac{1}{2}$ "
B, Small.....	$\frac{3}{4}$ "	2 "	3 "
B.....	$1\frac{1}{8}$ "	$2\frac{1}{8}$ "	$3\frac{1}{2}$ "
C.....	3 "	$2\frac{3}{8}$ "	$4\frac{1}{2}$ "
D.....	8 "	$3\frac{1}{2}$ "	$5\frac{1}{4}$ "

ENGINE CUPS—SHELL CASED.

No.		Capacity.	Diameter.	Height.
No. 20.	.....	$\frac{1}{8}$ oz.	1 in.	$1\frac{1}{2}$ in.
" 21.	$\frac{1}{8}$ "	$1\frac{1}{8}$ "	$2\frac{1}{4}$ "
" 28.	$\frac{1}{4}$ "	$1\frac{1}{2}$ "	$2\frac{1}{2}$ "
" 36.	1 "	2 "	$3\frac{1}{2}$ "
" 42.	$1\frac{1}{4}$ "	2 "	4 "
" 60.	$2\frac{1}{2}$ "	$2\frac{3}{8}$ "	$4\frac{1}{4}$ "
" 72.	$4\frac{1}{2}$ "	3 "	$4\frac{1}{2}$ "
" 100.	1 qt.	$5\frac{1}{4}$ "	10 "

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FOR PRICES SEE ACCOMPANYING LIST.

PATENT SHAFTING AND ENGINE OIL CUPS,

With Regulating Screws and Patent Adjusting Knob.

Shafting Oiler.

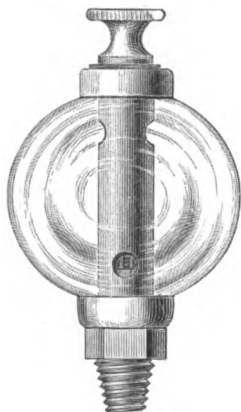


Fig. 166.

Sectional View.

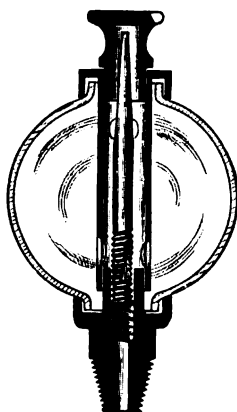


Fig. 167.

Engine Oilier.

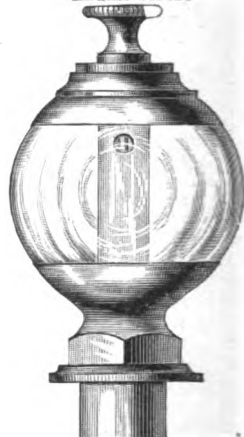


Fig. 168.

These Cups are suitable for all kinds of shafting, especially fast running, and are also well-adapted for Pickers, Looms, Lathes, etc. They are provided with a threaded shank, to enable them to be screwed firmly into bearings.

The supply of oil is regulated by means of a graduating slotted brass wire, and is capable of being increased or diminished with the utmost precision, by adjusting this wire, which extends upward through the centre of the cup, and is easily reached by removing the knob. A slot in the knob enables it to be used as a wrench to adjust the regulating screw to the desired point. This most convenient device has been patented and cannot be applied to any Oil Cups except those we manufacture without liability for infringement of patent.

SIZES AND CAPACITIES.

SHAFTING OILERS.				ENGINE OILERS.			
No.	Capacity.	Diameter.	Height.	No.	Capacity.	Diameter.	Height.
4	$\frac{3}{8}$ oz.	$1\frac{1}{2}$ in.	$2\frac{1}{2}$ in.	5 $\frac{1}{2}$	$\frac{3}{4}$ oz.	$1\frac{1}{2}$ in.	3 in.
5	$\frac{1}{2}$ "	$1\frac{3}{4}$ "	$2\frac{3}{4}$ "	5 $\frac{3}{4}$	$1\frac{1}{8}$ "	2 "	$3\frac{1}{2}$ "
5 W.B.	$\frac{3}{8}$ "	$1\frac{1}{8}$ "	$2\frac{1}{4}$ "	6 $\frac{1}{4}$	2 "	$2\frac{1}{8}$ "	4 "
6	2 "	$2\frac{3}{8}$ "	$3\frac{3}{8}$ "	7 $\frac{1}{4}$	$3\frac{1}{8}$ "	$2\frac{3}{8}$ "	$4\frac{1}{2}$ "
7	$3\frac{1}{4}$ "	$2\frac{3}{4}$ "	4 "	8 $\frac{1}{4}$	5 "	3 "	$5\frac{1}{4}$ "
8	5 "	3 "	$4\frac{1}{2}$ "				

NICKEL PLATING EXTRA, ACCORDING TO SIZE.

Dynamo and Electrical Machinery Oilers.

The above style of Cups, fitted with patent loose acting wire of brass, are extensively used for Dynamos and Electrical Light Machinery with the best results.

No. 5a.—	} Capacity and price list the same as Shafting Oilers above.
" 5a.—	
" 6a.—	
" 7a.—	
" 8a.—	

Several of the other styles are also suitable, and may be similarly fitted to order without extra charge.

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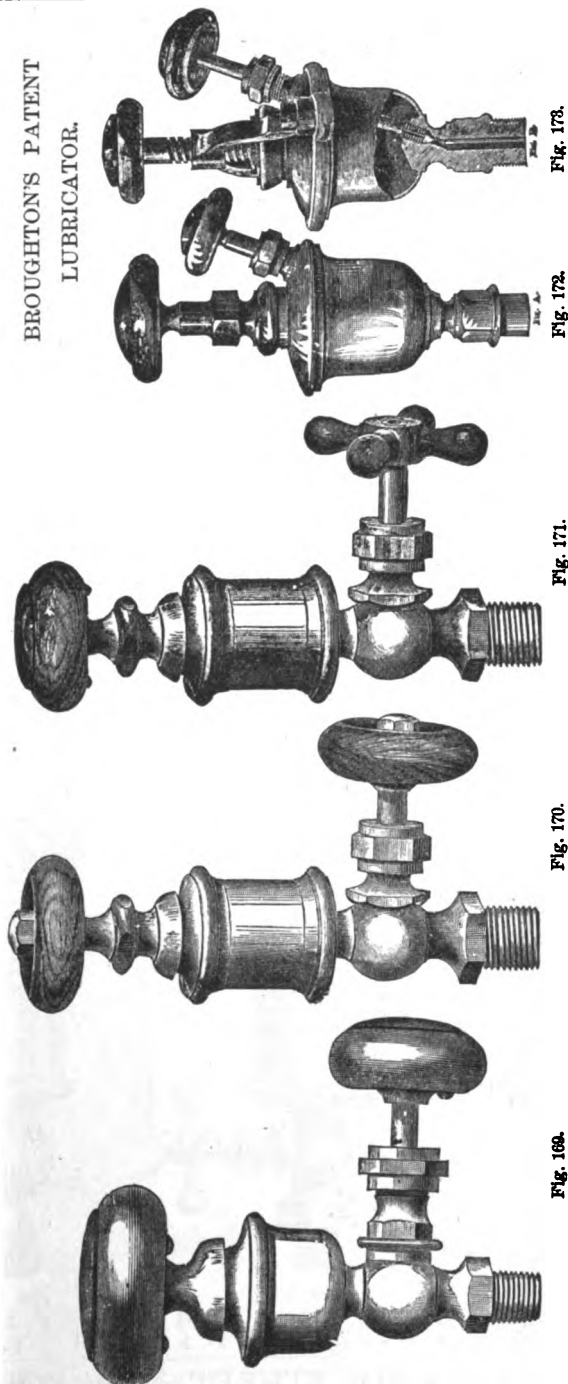
FOR PRICES SEE ACCOMPANYING LIST.

VALVE LUBRICATORS.

COOKE & CO.

63

BROUGHTON'S PATENT
LUBRICATOR.



Number.....	00	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Size pipe thread, in.	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Diam. bowl, inch.	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Size pipe thread, in.	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4

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DREYFUS' SELF-ACTING LUBRICATORS FOR STEAM CHESTS OF ALL KINDS.

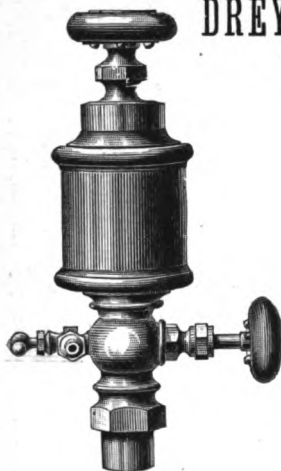


Fig. 174.
PLAIN, WITHOUT YOKE.

Size.....	1	1½	2	2½	3	4
Capacity.....	1/8	1/4	1/2	3/4	1	1½

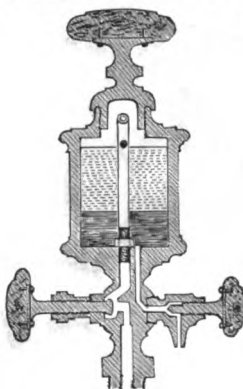


Fig. 175.
INTERIOR VIEW.

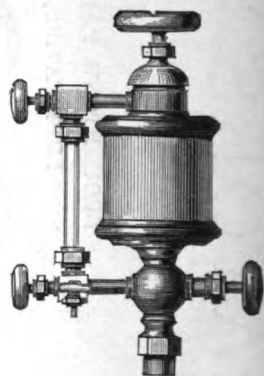


Fig. 176.
WITH GLASS INDICATOR.

PLAIN, WITHOUT YOKE.				INTERIOR VIEW.				SIDE VIEW.			
Size.....	1	1½	2	2½	3	4	2	2½	3	3½	inches
Capacity.....	1/8	1/4	1/2	3/4	1	1½	1/8	1/4	3/4	1	pints

EXPLANATION OF HOW THE LUBRICATOR OPERATES.

While the engine is in motion, the steam passes up the Tube to the upper part of the Cup where it condenses, and the water so produced, being heavier than the oil, sinks to the bottom and lifts an equal amount of the lubricant to the top, causing it to overflow through the side hole near the top of the Tube to the parts where the lubrication is required.

At the end of the day, or when the oil or tallow is exhausted, water, acids and other impurities which remain should be drawn off by the waste cock, and the cup be refilled with the lubricant.

Improved Seat Lubricator.

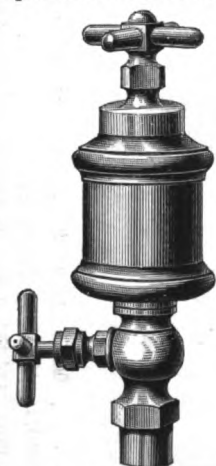


Fig. 177.

Size, inches....	1	1½	2	2½	3	3½
Capacity, pts...	1/8	1/4	1/2	3/4	1	1½

Funnel Shaped Top
Lubricator.

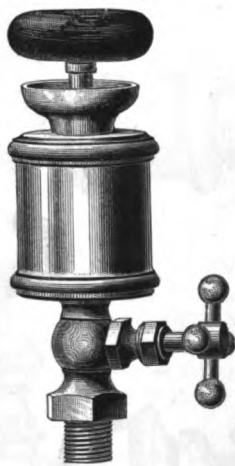


Fig. 178.

Size, inches....	1½	1½	1½	2	2½	2½	3
Capacity, pts...	1/8	1/4	1/2	3/4	1	1½	2

Common Lubricator.

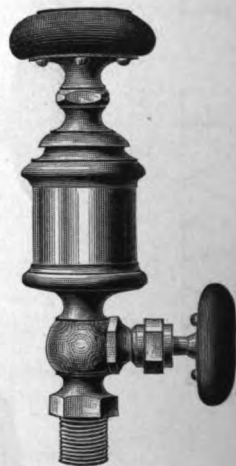


Fig. 179.

Size, inches....	2	1	1½
Capacity, pts...	1/8	1/4	1/2

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FOR PRICES SEE ACCOMPANYING LIST.

DREYFUS' HYDROSTATIC LUBRICATOR.

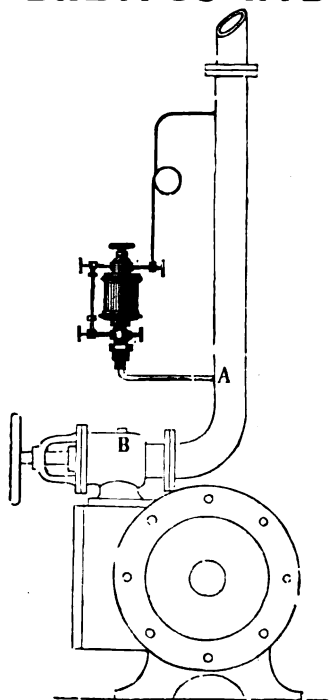


Fig. 180.

Size, inch.....	2 1/2	3	4	5
Capacity.....	1/2 pt.	1 pt.	1 qt.	3 pts.

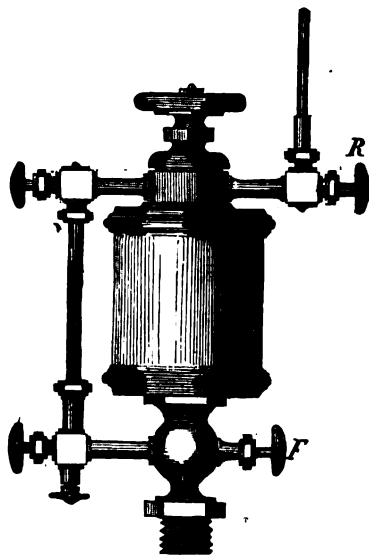


Fig. 181.

Glass Gauge Lubricator.
Solid Body.

Patent Self-Acting Lubricator for Locomotives and Marine Engines

WITH YOKE.

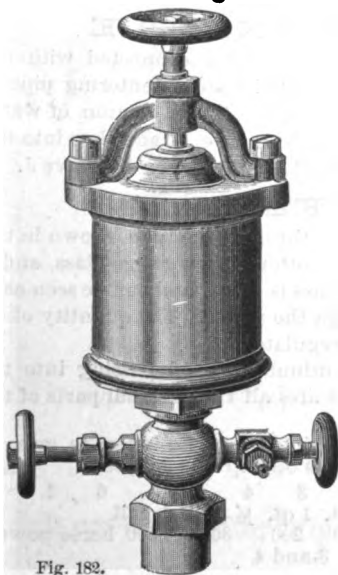


Fig. 182.

Size, inch.....3, 4, 5, 6, 7.

These Cups will run 90 to 120 miles with each filling.

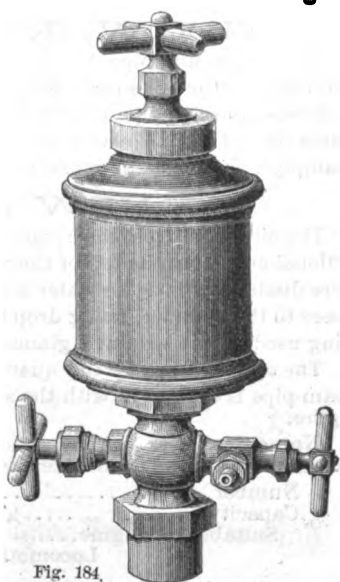


Fig. 184.

Cross Handle Outside Thread, Loose Disk Valve.

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FOR PRICES SEE ACCOMPANYING LIST.

The Siebert Cylinder Oil Cup.

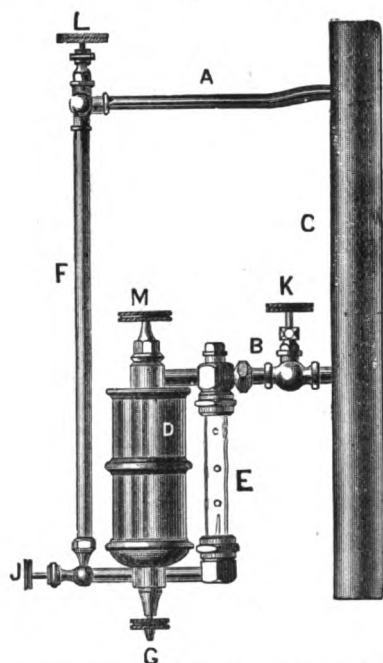


Fig. 185.

THE WORKING PRINCIPLE.

The condensing pipe A and the discharge pipe B being connected with the steam pipe C, the pressure in both pipes is equal, but the steam entering pipe A condenses and fills pipe F with water, and the weight of this column of water causes the oil in the reservoir D to pass out through pipe B, and thus into the steampipe, as fast as the water from pipe F is fed into the reservoir by valve J.

NEW SIGHT FEED.

The oil forced from the reservoir passes down through the tube, shown in the sectional cut, from the top of the reservoir to the bottom of the gauge-glass, and is there discharged into the water with which the glass is filled, and can be seen as it passes to the cylinder, rising drop by drop through the water. The quantity of oil being used is thus seen at a glance and the feed regulated.

The oil is fed in just the quantity needed continuously, and passing into the steam-pipe is carried in with the steam and lubricates all the internal parts of the engine.

Numerous cases can be cited where the engines show an average gain of several revolutions per minute since the use of this oil-cup was adopted.

Number.....	1	2	3	4	5	6	:
Capacity.....	$\frac{1}{4}$ pt.	$\frac{1}{2}$ pt.	1 pt.	1 qt.	$\frac{1}{2}$ gall.	1 gall.	
Suitable for engine.....	10	25	100	200	300	500 horse power.	
Locomotive Cups, Nos. 3 and 4.							

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FOR PRICES SEE ACCOMPANYING LIST.

THE HOLLAND IMPROVED AUTOMATIC LUBRICATOR,

THE VERY LATEST IMPROVEMENT IN LUBRICATORS.

*A Saving of from 50 to 90 per cent. in the
cost of Lubricants.*

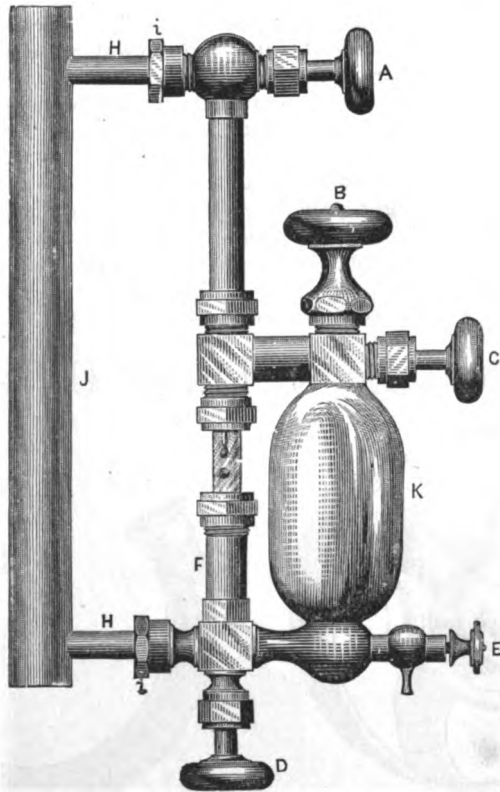


Fig. 186.

*A Uniform, Visible and Continuous Feed
of Oil Guaranteed.*

SPECIAL NOTICE.—Before filling with Oil, put $\frac{1}{2}$ gill of water in Reservoir.

Give full opening to throttle valve of engine before operating.

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FOR PRICES SEE ACCOMPANYING LIST.

Directions to Apply and Operate the Holland Lubricator.

Make the small one-quarter inch pipe connection above the throttle valve, do not fail to place a one-quarter inch Globe Valve in same as shown by letter G. Drill and tap steam pipe as near the governor as possible for the lower connection. Use care in attaching so as to avoid straining the joints.

Screw all valves to their seats, with the exception of valve G, which leave open, for the steam to condense in condenser and steam pipe; unscrew cap A and fill reservoir H with oil; open valves C and E to regulate the flow of oil; open valve B and unscrew nut F to take out Glass Tube. To refill, close valves C and G, then unscrew cap A and open cock D to draw off the water of condenser.

Our patent, which was granted July 5, 1881, is on a downward visible feed, forced through a glass tube by the circulation of steam, making it the most positive and reliable Lubricator in the market, and is the only one manufactured operating on this principle.

This Lubricator can be controlled so as to feed from one to sixty drops per minute, always passing in sight, drop by drop, through the glass tube. By using this Lubricator all danger of cutting valves or the cylinder of the engine is avoided, and a saving of from 50 to 90 per cent. in the cost of oils warranted.

Patent Loose Pulley Oilers.

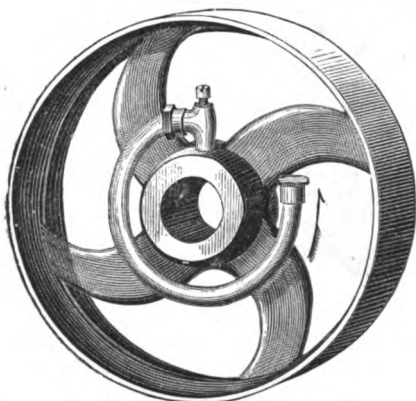


Fig. 187.



Fig. 188.

Fig. 187 represents the Oiler adjusted to Pulley. Fig. 188 represents the Oiler. The only PERFECT Oiler for loose pulleys. We guarantee them to work satisfactorily in all respects. A trial of them has never failed to bring us further orders, as they recommend themselves.

Inside diam. of Circle.....	2½	3	3½	4	4	4½	5	5½	6	7	inches.
Size of Tube.....	½	½	½	½	¾	¾	¾	¾	¾	¾	"

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FOR PRICES SEE ACCOMPANYING LIST.

GREASE CUPS.

ORNAMENTAL.



Fig. 189.

SIZES.		
No.	Diam.	Pipe Thread.
1	2 1/8 in.	1/8 in.
2	2 3/8 in.	1/4 in.
3	3 in.	3/8 in.

ACORN.



Fig. 190.

SIZES.		
No.	Diam.	Pipe Thread.
0	1 1/8 in.	1/8 in.
1	1 3/8 in.	1/4 in.
2	1 7/8 in.	3/8 in.
3	2 1/8 in.	1/2 in.
4	2 3/8 in.	5/8 in.
5	3 in.	3/4 in.

CAST.



Fig. 191.

SIZES.		
No.	Diam.	Pipe Thread.
0	1 1/8 in.	1/8 in.
1	1 3/8 in.	1/4 in.
2	1 7/8 in.	3/8 in.
3	2 1/8 in.	1/2 in.
4	2 3/8 in.	5/8 in.

CAST BOTTOM.



Fig. 192.

SIZES.		
No.	Diam.	Pipe Thread.
1	2 1/8 in.	1/8 in.
2	2 3/8 in.	1/4 in.
3	3 in.	3/8 in.

SHEET BRASS OR ZINC.

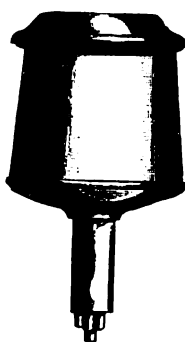


Fig. 193.

SIZES.		
No.	Diam.	Height.
1	2 in.	2 1/8 in.
2	2 1/2 in.	2 3/8 in.
3	3 in.	3 1/8 in.

GLASS—CAST BOTTOM.



Fig. 194.

SIZES.		
No.	Diam.	Height.
0	1 1/2 in.	1 3/4 in.
1	2 in.	2 1/8 in.
2	2 1/2 in.	2 3/8 in.



Fig. 195.

SIZES.		
No.	Diam.	Pipe Thread.
1	2 1/4 in.	1/8 in.
2	2 3/4 in.	1/4 in.

OFFSET GLASS.

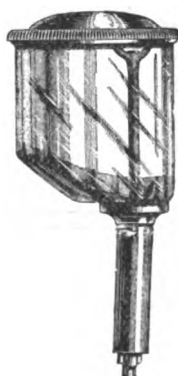


Fig. 196.

Sizes same as Fig. 194.
This shape of cup also made of zinc;
sizes same as Fig. 193.

ANY OF THE ABOVE CUPS NICKEL-PLATED IF SO ORDERED.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

GREASE CUPS.

SUGAR LOAF.



Fig. 197.

LOCOMOTIVE.



Fig. 198.

CRANK PIN CUP
For Beam Engines.

Fig. 199.

Size.	Diam.	Height.	Thread.	Diam.	Height.
No. 1,	1 $\frac{1}{8}$ in.	2 $\frac{1}{2}$ in.	$\frac{1}{4}$ or $\frac{3}{8}$ in.	No. 2,	2 $\frac{1}{2}$ in. 3 $\frac{1}{4}$ in.

CRANK PIN CUP.
For Propeller Engines.

Fig. 200.

SHEET METAL CUP.



Fig. 201.

Figures 199, 200 and 201 are only made to order; in ordering them a sketch should be sent giving shape and size of cup required.

LUBRICATING COMPOUND.

Our Lubricating Compound is made in Four Regular Numbers and one extra.

No. 0 Is very soft, being used in extreme cold weather and on exposed journals.

No. 1 Is harder than No. 0, and is used on ordinary journals in cold weather, or on very cool or slow running journals.

No. 2 Is harder than No. 1, and is the grade ordinarily used in moderate and warm weather.

No. 3 Is adapted to the use of all Stationary, Marine and Tug Boat Engines; also, Shafting in warm weather, and seldom fails to cool the warmest journals and make Lubrication easy.

We also make a grade of Extra Hardness (No. X) which will Lubricate journals with entire satisfaction when no oil or lubricant of any kind would work.

Is packed in 2 $\frac{1}{2}$, 5, 10, 20, 25, 30 and 50 lb. cans, 100 lb. kegs, and bbls. averaging 350 lbs.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

OIL CANS.

PARAGON OILERS.

Fig. 202.

Zinc, tin bottoms.
Zinc, brass bottoms.
All Brass.
All Copper.
Nos. 0 to 6.

Malleable Iron Oiler.

Fig. 204.

Nos. 1, 2 and 3.

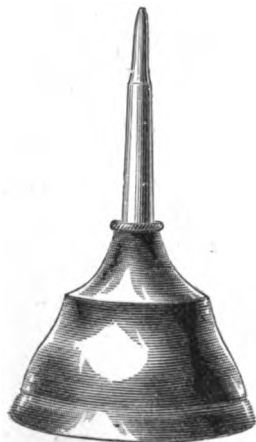


Fig. 204.

PRIOR'S OILERS.—Fig. 203.

Zinc, Tin or Brass Bottoms.
Brass or Nickeled “
Nos. 0 to 6.

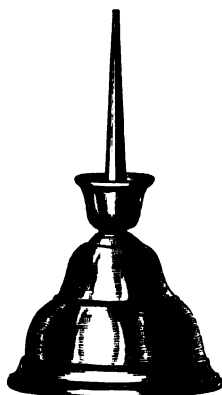


Fig. 202.



Fig. 203.

Brass, Copper or Zinc Oil Fillers. $\frac{1}{4}$, $\frac{1}{2}$, 1, $1\frac{1}{2}$, 2, pints.

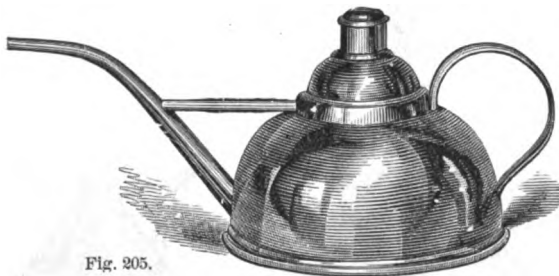


Fig. 205.

BRASS, COPPER OR TIN TALLOW CAN,



Fig. 206.

ONE,
TWO
or
THREE
QUARTS.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

OIL CANS, Etc.

LOCOMOTIVE SPRING OILER.

Brass or Tin, 1, 1½, 2 or 3 pints.

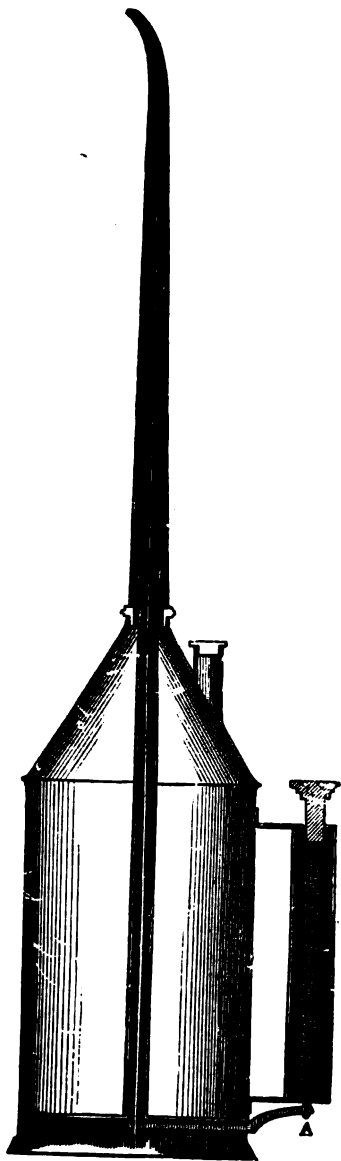


Fig. 207.

These Cans will be furnished without valves when desired.

HORIZONTAL OILER,
WITH VALVE AND SPRING.

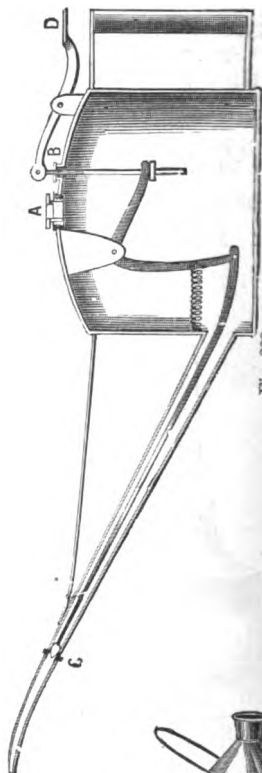


Fig. 208.

BRASS OR TIN.

Sizes.....1 and 2 pints.



Fig. 209.

OIL CANS,
With or
Without
Spout

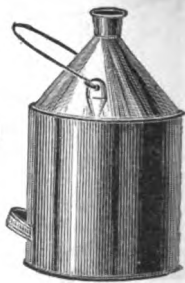


Fig. 210.

½, 1, 2, 3, 4, 5 10 gallons.

TIN OIL FEEDER.



Fig. 211.

½, 1 and 2 pints.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Mowing Machine Oiler,
ROUND OR OVAL.

OIL CANS, Etc.

PARAGON OILER SETS,

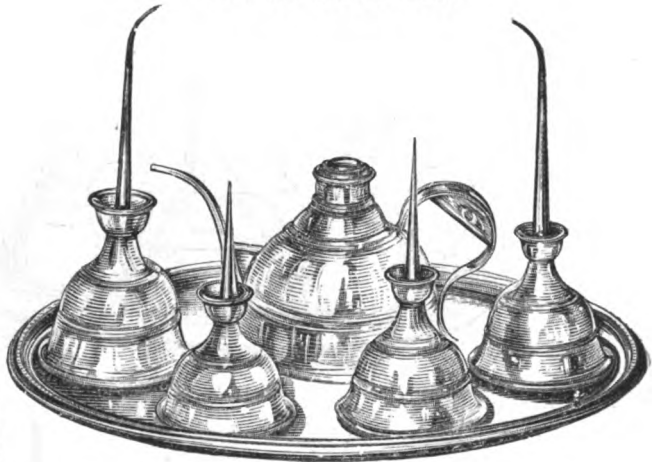


Fig. 213.

Copper, Brass or Nickeled. Large or small set.



Fig. 212.



Fig. 214.

Dripping Machine Oiler—with or without Handles.

ENGINEER'S DRIP OAN.



Fig. 215.

1, 1½ and 2 pints.

22 CORTLANDT STREET. NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

COOKE & CO.
OILER SETS.

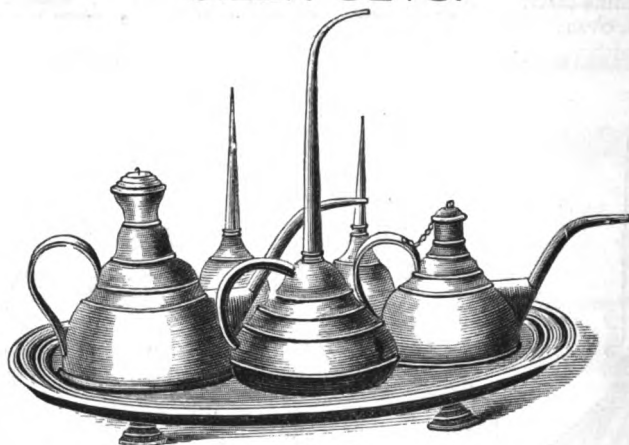


Fig. 216.

No. 2..... With 3 oilers and 2 cans, brass or nickeled.

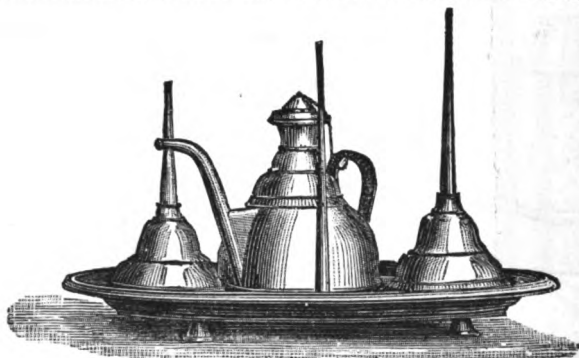


Fig. 217.

No. 1..... With 2 oilers and 1 can, brass or nickeled.

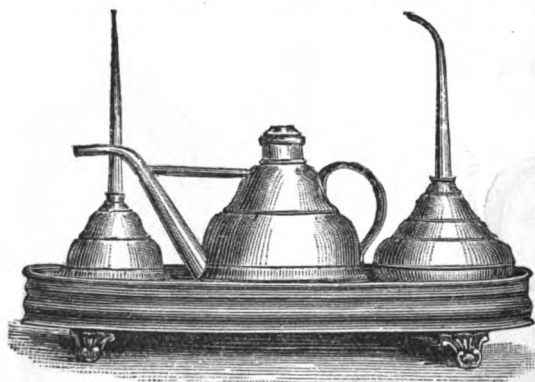


Fig. 218.

No. 1½..... With 2 oilers and 1 can, brass or nickeled.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

DEVERALL'S OILERS.

ENGINE OILERS.

Straight.



Fig. 219.

Flaring.



Fig. 220.

Nos. 1, 2 and 8, with 8 inch tubes.

10, 15, 18 and 21 inch tubes extra.

**STEEL TIP
Bench Oiler.**

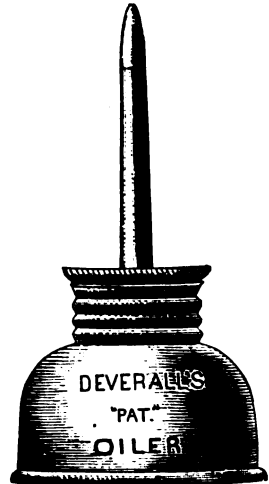


Fig. 221.

Nos. 1, 2 and 8.

HAND CYLINDER OIL PUMP.

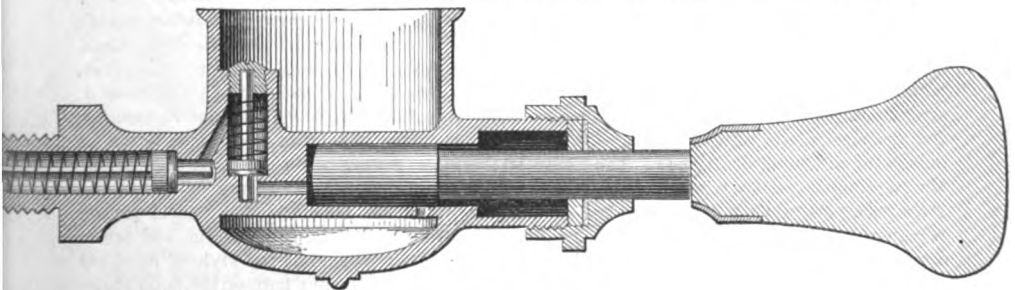


Fig. 222.

Every engine room should be supplied with one of these pumps for use in case the Automatic oil feeder gives out.

Made with screw or strainer top, or with bowl for tallow.

Number	8	04	4	5
Size, inches,	2x2	2½x2½	3½x3½	7x4½

22 CORTLANDT STREET, NEW YORK

FOR PRICES SEE ACCOMPANYING LIST.

THE PERFECTED OIL TANK.



OPEN AND IN USE.

Fig. 223.

THE ONLY RADICAL IMPROVEMENT IN OIL TANKS.

SIZES.

No. 1.....	6 gallons.
No. 2.....	12 "
No. 3.....	25 "
No. 4.....	60 "
No. 5.....	100 "
No. 6.....	150 "
No. 7.....	200 "
No. 8.....	250 "

Measures (5 pieces) furnished at an extra price.

Our long experience in the sale of Oil Tanks has made us familiar with the wants of the trade, and in the **PERFECTED TANK** we believe we offer an article that merits universal commendation. A cheap oil tank (which means a poor one) is no economy, and we shall not manufacture two grades. There is just as much difference between the "Perfect Tanks," and cheap, old-style tanks, as there is between the best and the poorest articles you sell. Every tank (larger than 25 gallons) is provided with one of *Mason's Celebrated Double-Action Force Pumps*, which costs five times as much as the common pumps put into other tanks, and which throws a perfectly even, steady stream, exactly one gallon for every 16 strokes, making it self-measuring. This pump was recently adopted by the *United States Government*, after a competitive examination, in which *seventeen of the best "Tank Pumps" were represented*. The positive merits of the Mason Pump should create for it a large sale (irrespective of tanks) for all kinds of liquids. The pump is the *main feature* of an oil tank, and as the Mason Pump saves so much time and labor, by its simple and rapid action, it makes the **PERFECTED TANK** by far the best in market. Our tanks are made of the finest quality of galvanized iron throughout; have a solid wood bottom under the iron bottom, and are so elegantly japanned that they make an attractive fixture. By reason of the style of hood (or cover), these tanks take up less space than any other tanks—the front half of the hood slides around easily outside of the rear half, thus requiring no extra space at the top or back when opened, so that you can set the tank against the wall and under a shelf—the entire area of the tank is thus utilized for the storage of measures, etc. The body of the tank is made of one piece of iron with one seam. They are carefully tested before shipment, and are guaranteed not to leak. The pump can be removed to transfer the oil from the barrel to the tank. The entire hood and drip-pan can be taken off to clean the tank.

It does not pay to buy a poor oil tank; the best is the cheapest.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

WILEY OIL CABINETS.

ONE OR MORE COMPARTMENTS.

25 to 300 GALLONS CAPACITY.

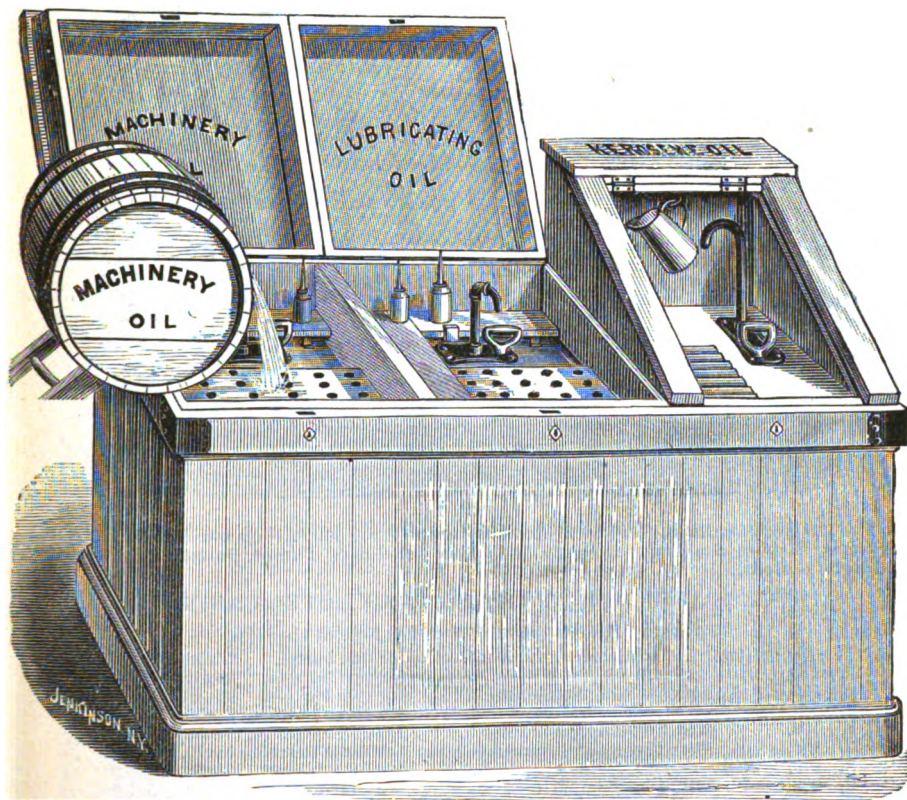


Fig. 224.

A 180 gallon Factory Oil Cabinet, with three compartments for three kinds of oil. This engraving shows how heavy oils may be run from the barrel into the Cabinet, thus saving the pumping.

These Factory Cabinets are made to hold from one to five barrels of oil; they are also made with compartments, to hold different kinds of oil. (*See price list.*) For railroads, steamships, machine shops, cotton and woolen mills, they have no equal. They are adapted to every place where oil is used.

NOTE.—Each Store Cabinet is supplied with a tin pump for pumping the oil from the barrel into the Cabinet, or four feet of rubber tubing for siphoning the oil from the barrel into the Cabinet, as preferred, and full set of measures. Each Factory Cabinet is supplied with a tin pump for pumping the oil from the barrel into the Cabinet, or four feet of rubber tubing for siphoning the oil from the barrel into the Cabinet, as preferred.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

WILEY OIL CABINETS.

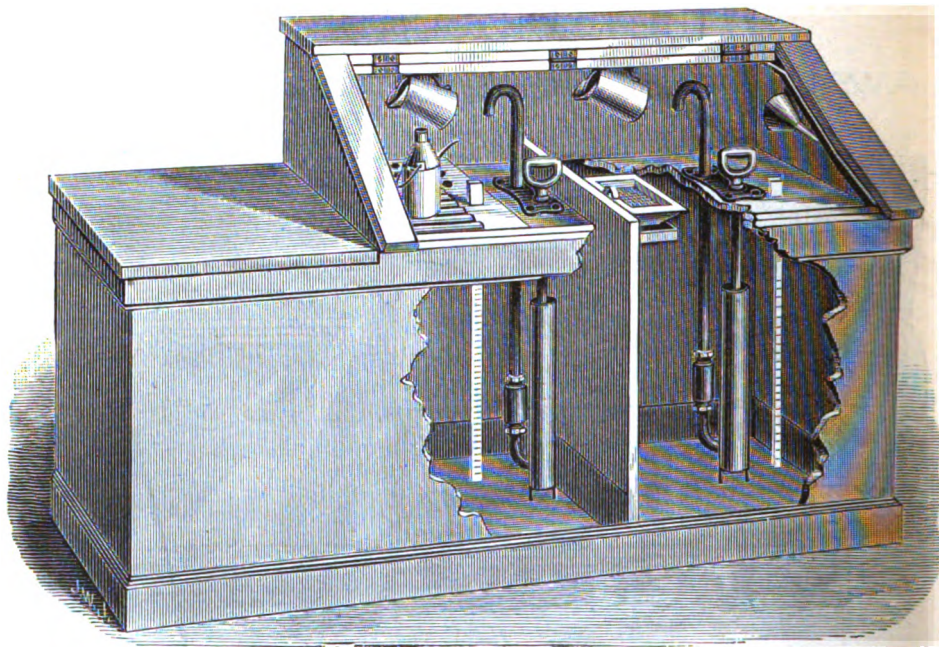


Fig. 225.

The interior of a 270 gallon Double Store Cabinet—three barrels on one side and two on the other, showing the Lead bottom, Zinc sides, position of Pumps, Gauge Rod, Strainer, Hydraulic Seal, &c.

GROCERS', DEALERS', FAMILIES' AND HOTEL CABINETS.

The Store Cabinets are all 49 inches high at the back.

No.	gallons			size in inches.
2,	60	.....	for one barrel,	22x32,
3,	110,	.....	for two barrels,	26x41,
4,	120,	.....	for two compartments.....	for two barrels,
5,	160,	.....	for three barrels,	28x56,
6,	170,	.....	with two compartments.....	for three barrels,
7,	180,	.....	with three compartments.....	for three barrels,
8,	210,	.....	for four barrels,	34x58,
9,	220,	.....	with two compartments.....	for four barrels,
10,	260,	.....	for five barrels,	34x69,
11,	270,	.....	with two compartments.....	for five barrels,
12,	300,	.....	with five compartments.....	for five barrels,

FACTORY, MACHINE SHOP, RAILROAD, BREWERY & SS. CABINETS.

The Factory Cabinets are all 39 inches high, front and back.

No.	gallons			size in inches.
1,	25	.....	36 inches high,	16x16,
2,	60	.....	for one barrel,	26x28,
3,	110	.....	for two barrels,	26x49,
4,	120	.....	with two compartments.....	for two barrels,
5,	160	.....	for three barrels,	26x54,
6,	170	.....	with two compartments.....	for three barrels,
7,	180	.....	for three barrels,	26x70,
8,	210	.....	with three compartments.....	for three barrels,
9,	220	.....	for four barrels,	26x80,
10,	260	.....	with two compartments.....	for four barrels,
11,	270	.....	for five barrels,	26x86,
12,	300	.....	with two compartments.....	for five barrels,
		for five barrels,	26x88,
		for five barrels,	26x98,
		for five barrels,	26x100,
		for five barrels,	26x128,

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FOR PRICES SEE ACCOMPANYING LIST.

Engineer's Torch

BRASS OR TIN.

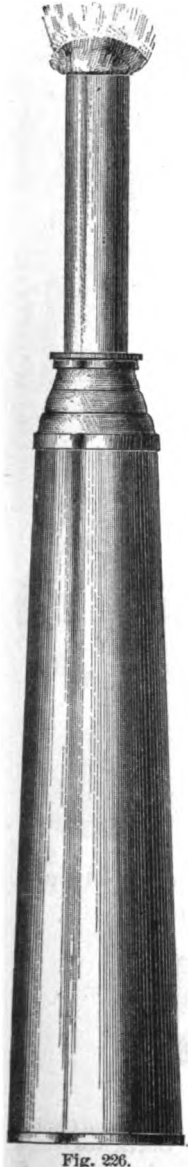


Fig. 226.

Detroit Sight-Feed Lubricator.

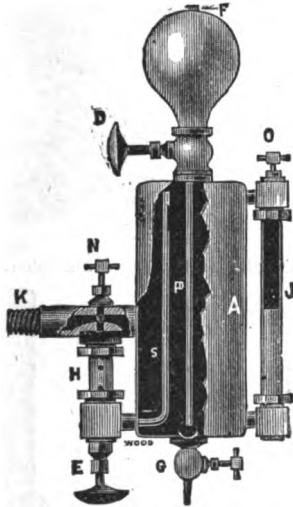


Fig. 227.

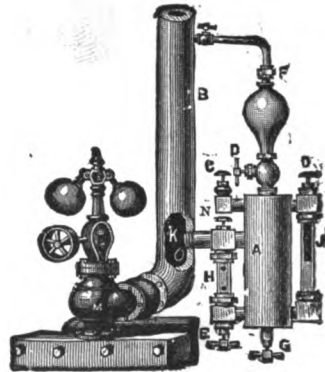


Fig. 228.

THEIR ADVANTAGES OVER OTHERS ARE :

- 1st. They secure a perfect and uniform lubrication of every part.
- 2d. Continuous and uniform feeding, fast or slow, the flow being regulated at will, and constantly in view.
- 3d. Economy. The oil is distributed evenly over all the surface reached by the steam, securing perfect lubrication, with a saving of from 50 to 90 per cent. over ordinary methods of applying, and thus preventing friction and wearing of the machinery.
- 4th. They contain a glass indicator tube which shows at all times the quantity of oil in the Lubricator, and a *sight feed glass*, which shows how *fast* the oil is being used, drop by drop, passing in sight to the parts to be lubricated.
- 5th. Simplicity of construction. The body of the cup being cast in one piece, it is not liable to leak or to get out of order.
- 6th. The cups are adapted to the use of and will feed any clean oil, *black or white, light or heavy*, and they are so constructed as to entirely overcome effects of pulsation.
- 7th. Should it become necessary, the cup may be cleansed by simply opening the valves, by which steam can be forced through every part, cleansing the cup without disconnecting it or stopping the engine.

These cups are also warranted to be the best in use for oiling locomotives, air brakes and steam pumps.

CAPACITIES AND SIZES.

SIZE.	Suitable for Engine with Diameter of Cylinder as follows :
Half pint.....	Up to 10 inches.
Pint.....	10 to 18 inches.
Quart.....	18 to 30 inches.
Half gallon.....	30 and over.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HAND LAMPS, ETC.



Fig. 229.
Tin, zinc, iron or brass. Sizes—No. 1, $\frac{1}{2}$ pint; 2, 1 pint.



Fig. 230.
Malleable iron—one size.

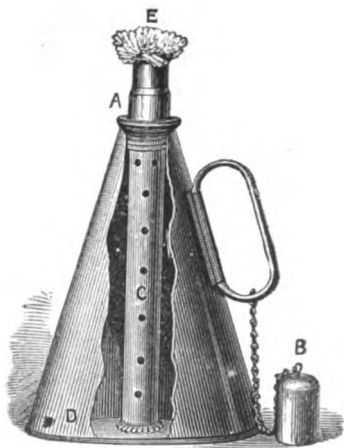


Fig. 231.
Gas Fitters' Alcohol Torch, tin or brass.



Fig. 232.
Locomotive Torch, tin or brass, broad bottom.

COMMON OIL CANS.

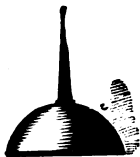


Fig. 233.
Mowing Machine
Oil can, diam., $3\frac{1}{4}$ in.

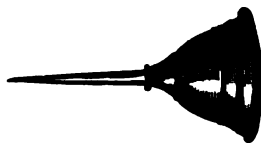


Fig. 234.
Tin Oiler, Nos. 0 to 3; Zinc, brass bot'm, Nos. 0 to 6; Brass and Copper
Oilers, Nos. 00 to 6.
Numbers..... 00 0 1 2 3 4 5 6
Diam. at bottom, in. $2\frac{1}{2}$ $2\frac{3}{4}$ 3 $3\frac{1}{2}$ $3\frac{3}{4}$ $4\frac{1}{4}$ $4\frac{3}{4}$ 5

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FOR PRICES SEE ACCOMPANYING LIST.

LANTERNS.

Nos. 2 and 3.—"MONITOR."
Flint globes.

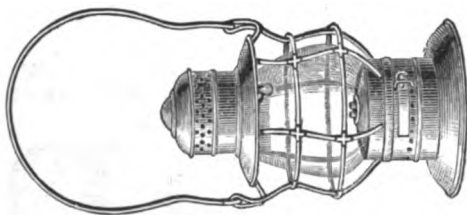


Fig. 241.

No. 11.—"GIANT."
Flint globes.

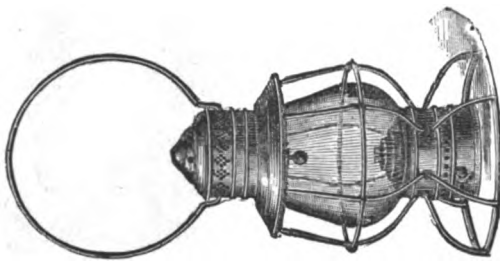


Fig. 240.

No. 39.—"S. G. S."
Lime globes.
CONDUCTOR'S QUEEN.
Brass or nickel.

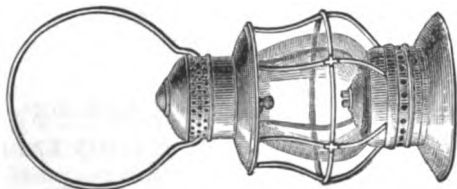


Fig. 239.

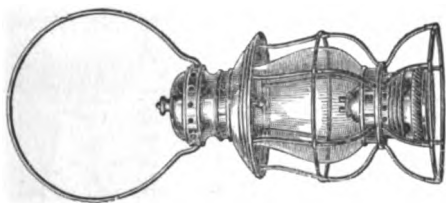


Fig. 238.

CONDUCTOR'S GEM.
Brass or nickel.

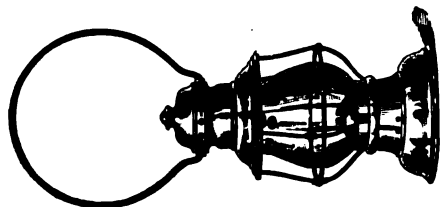


Fig. 237.

White, half white and half green globes.

No. 0.
For kerosene or candle.



Fig. 242.

"CHAMPION,"
for kerosene.



Fig. 243.

CONDUCTOR'S PET.
Same as the Gem, but
smaller.

Either brass or nickel,
white or half white and
half green globe.

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FOR PRICES SEE ACCOMPANYING LIST.

LANTERNS.

No. 8, "BEACON."
With or without
guards.



Fig. 244.

SQUARE STATION LAMP.

No. O, TUBULAR.
Can be regulated, filled, lighted and
extinguished without removing the
globe. With or without guards.

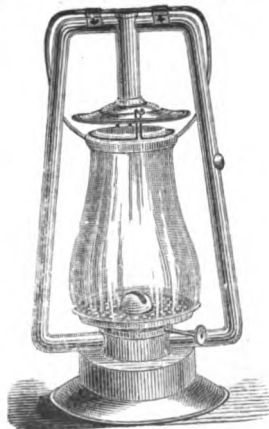


Fig. 245.

No. O, TUBULAR.
With reflector.

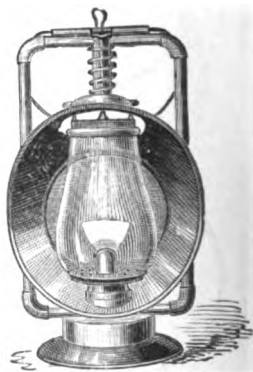


Fig. 246.

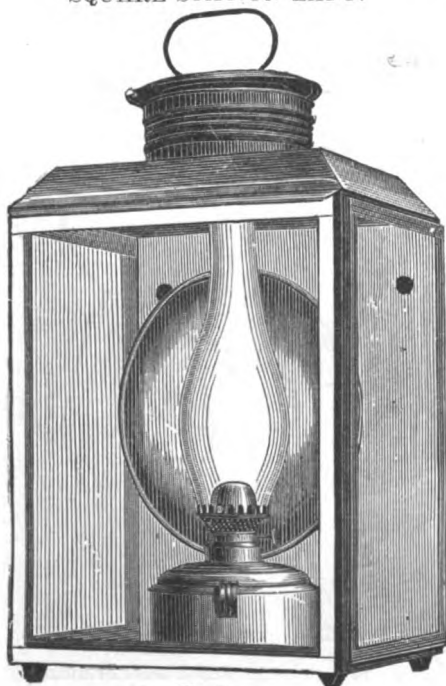


Fig. 247.

Sizes, 8x12 in., 10x14 in., 12x16 in.

BOW TOP
STATION LAMP.

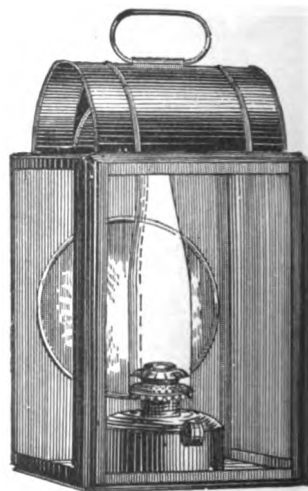


Fig. 248.

Sizes, 8x12 in., 9x13 in., 12x14 in.

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FOR PRICES SEE ACCOMPANYING LIST.

LANTERNS

SQUARE TAIL LAMP.

6 to 8 in. Bull's Eye.
 Ruby, Green, Blue or Plain



Fig. 249.

SIDE TRAIN SIGNAL

LAMP.

(SQUARE.)

4 in. Plain Fresnel
 and Slides of Ruby,
 Green or Blue Glass.



Fig. 250.

TRAIN SIGNAL LAMP.

SOLID TOP.

4 or 5 in. Semaphore, Fres-
 nel and Bull's Eye.
 Ruby, Blue, Green or Plain.

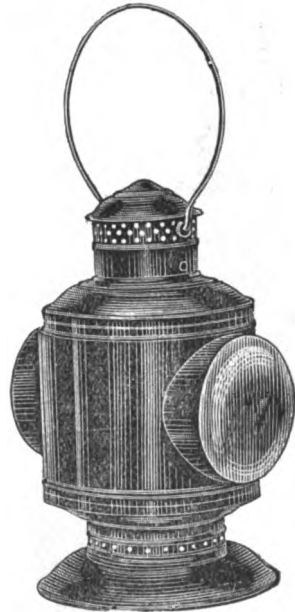


Fig. 251.

TRI-COLOR QUICK SIGNAL LANTERN.

Ruby, Green and Plain.



Fig. 252.

BULL'S EYE OR POLICE LANTERN.



Fig. 253.

Sizes.....2½ and 3 inches.

TRAIN SIGNAL LAMP.

Hinge Top, with
 double or single 4 in.
 plain Bull's Eye and
 slides of Ruby, Green
 or Blue Glass.



Fig. 254.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Locomotive, Cab or Steam Gauge Lamps.

PAINTED GLOBE.

Single or Double
Bull's Eye.

BRASS OR TIN.

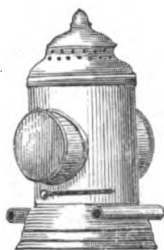


Fig. 255.

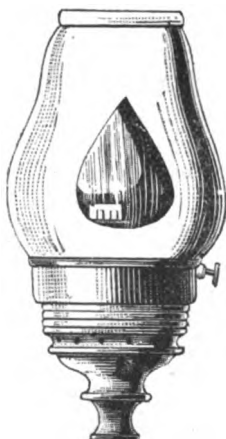


Fig. 257.

BRASS HOOD.



Fig. 258.

MILL LIGHT.



Fig. 259.

PACKING HOUSE LIGHT.

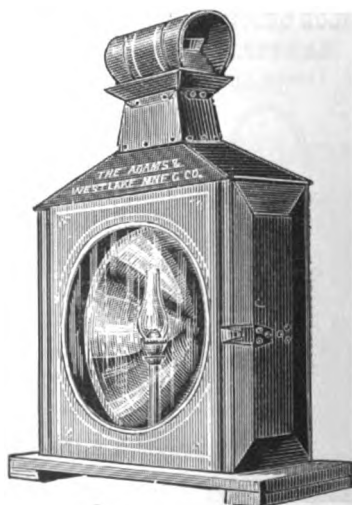


Fig. 260.

No. 3, Locomotive Headlight Burner.

" 4, Brilliant Argand.

17 inch Shallow Reflectors.

17 inch Shallow Reflector. Dual or
Argand Burner. Plain or ornamented
case.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST

LOCOMOTIVE HEAD LIGHTS

PLAIN HEAD LIGHT.

Black or ornamented.

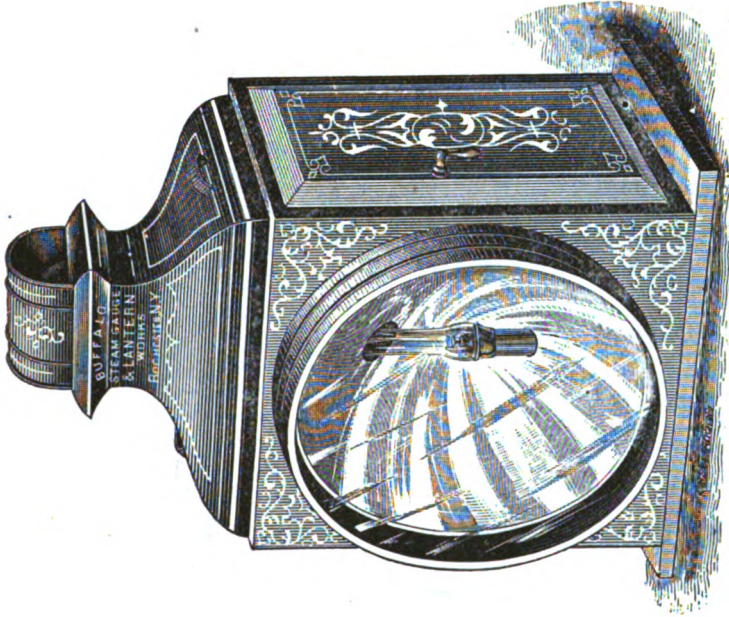


Fig. 201.

Sizes of reflectors.....16, 18, 20, 23 inches.

COMBINATION HEAD LIGHT.

Any colored signals desired, with or without transparent "number" glass.

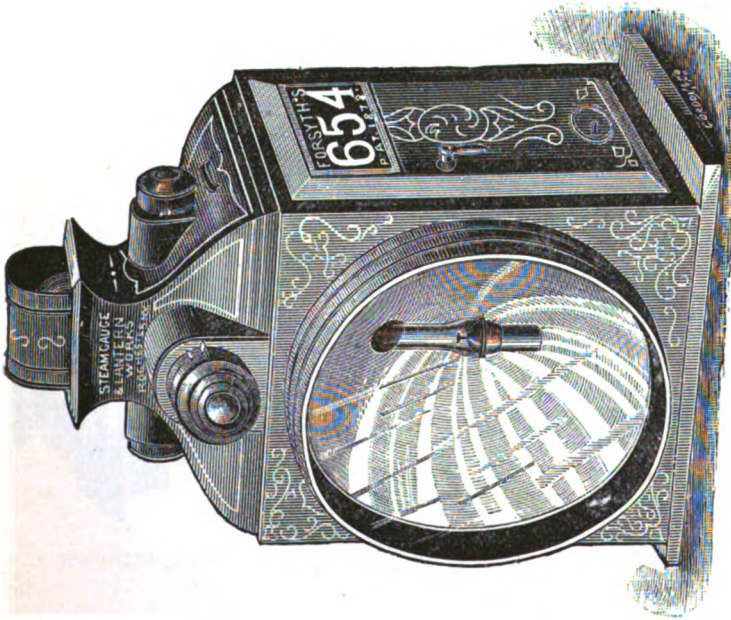


Fig. 202.

Size of reflector.... 23 inches.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

ROUND HEAD LIGHT.

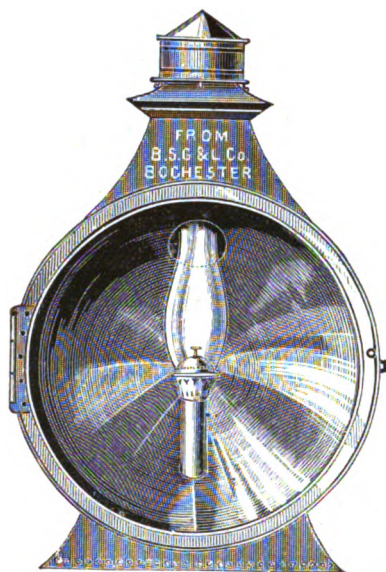


Fig. 263.

Sizes of Reflectors, 14 and 16 inches.

SIDE CAR LAMP FOR CANDLE.

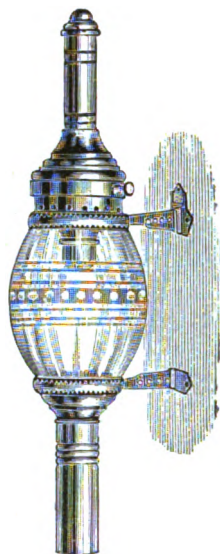


Fig. 264.

SIDE LAMP FOR SPERM OIL.

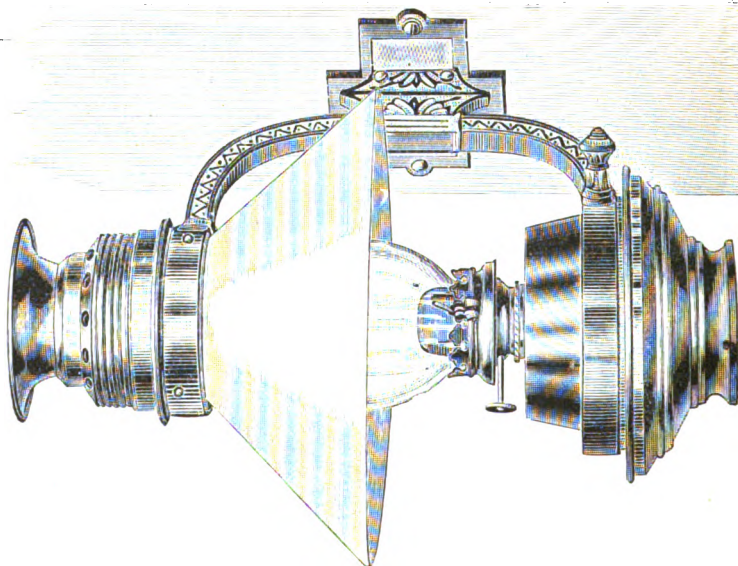


Fig. 265.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

CENTER LAMP, FOR BURNING CANDLES.

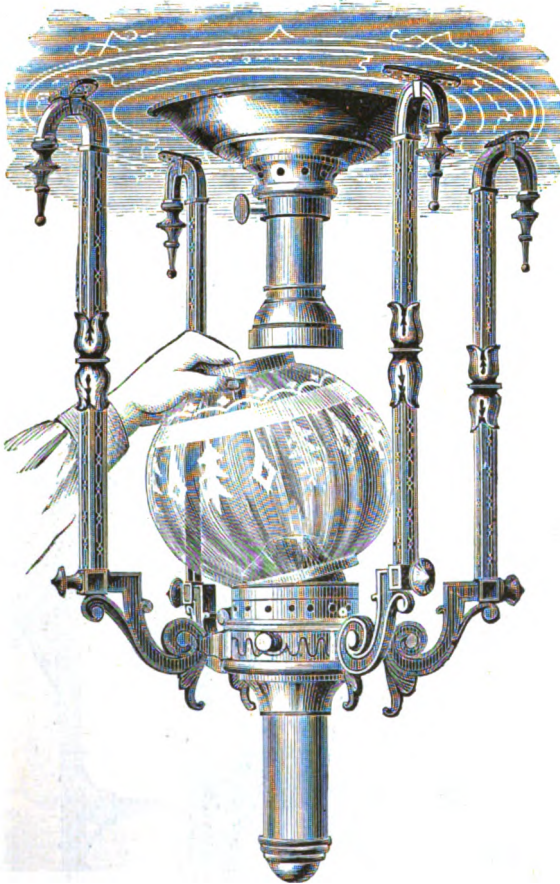


Fig. 266.

STANDARD DROP OVER ALL 25 INCHES,

With adjustable globe.

BRONZE OR GILT FINISH.

BRONZE OR GILT FINISH WITH NICKEL RELIEF.

SILVER OR NICKEL PLATED.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

CENTER LAMP FOR SPERM OIL.
Standard drop over all, 21½ inches.

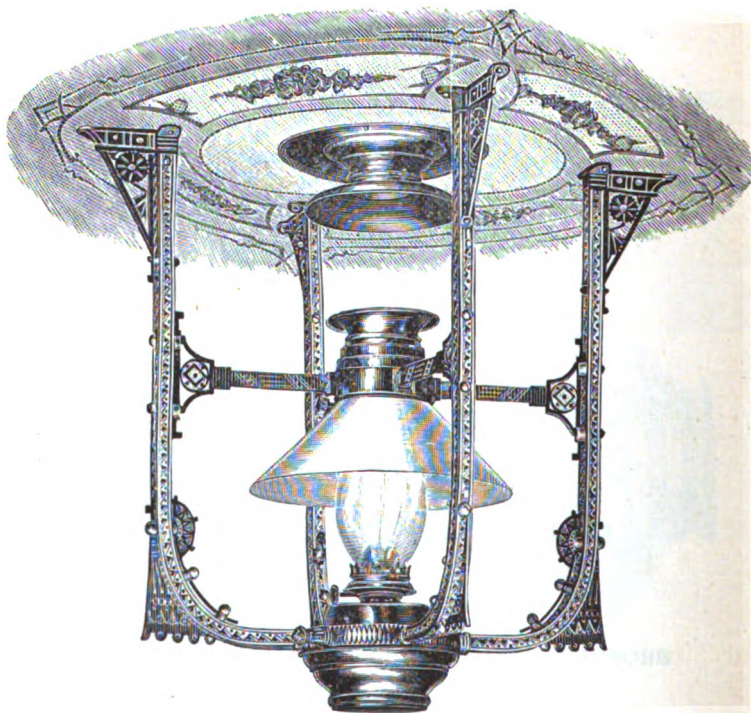


Fig. 368.

With Porcelain Shade, and Dual or Argand Burner.

CENTER LAMP FOR SPERM OIL.
For Narrow Gauge Cars.

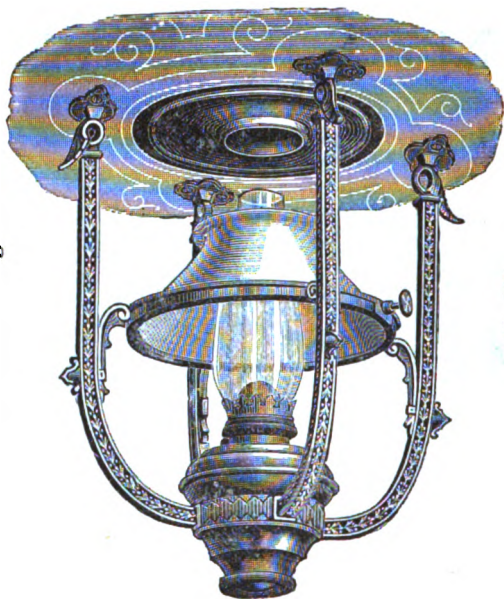


Fig. 367.

Porcelain Shade, Dual Burner. Standard Drop over all, 15½ inches.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

CHANDELIER.

Two Light. For Sperm Oil.

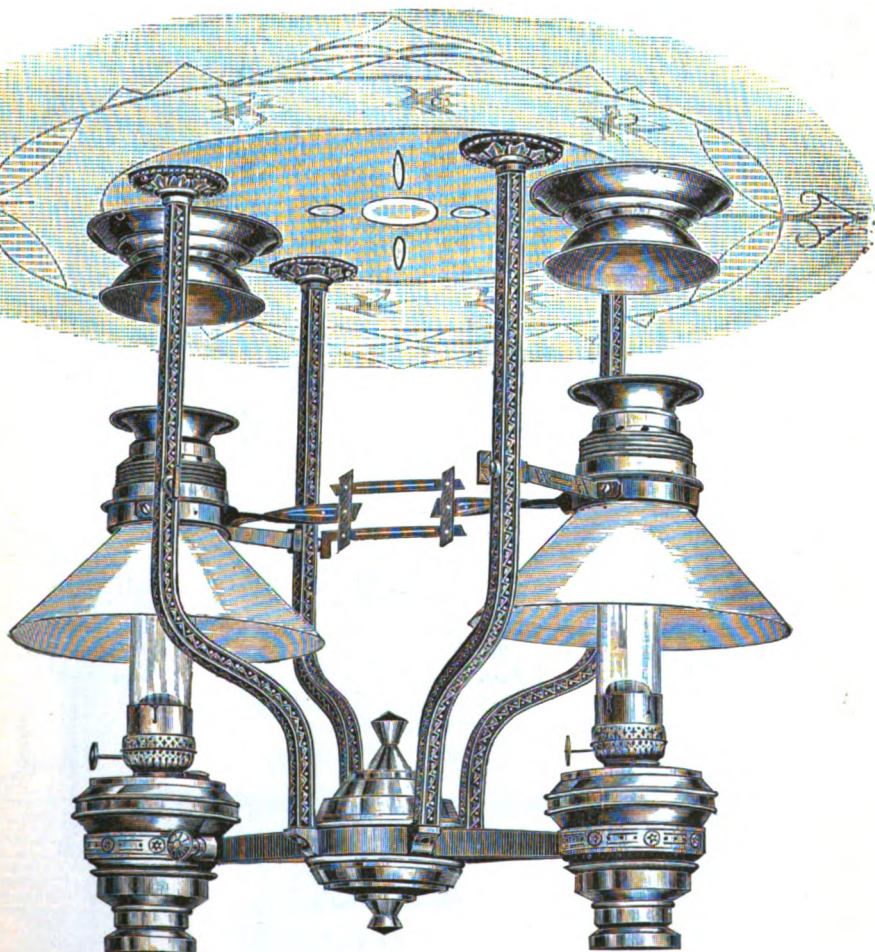


Fig. 269.

**Porcelain Shades. Dual or Argand Burners. Standard drop, over all 24 inches.
Separate founts.**

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST,

“TORNADO” CHANDELIER,

For Sperm Oil.

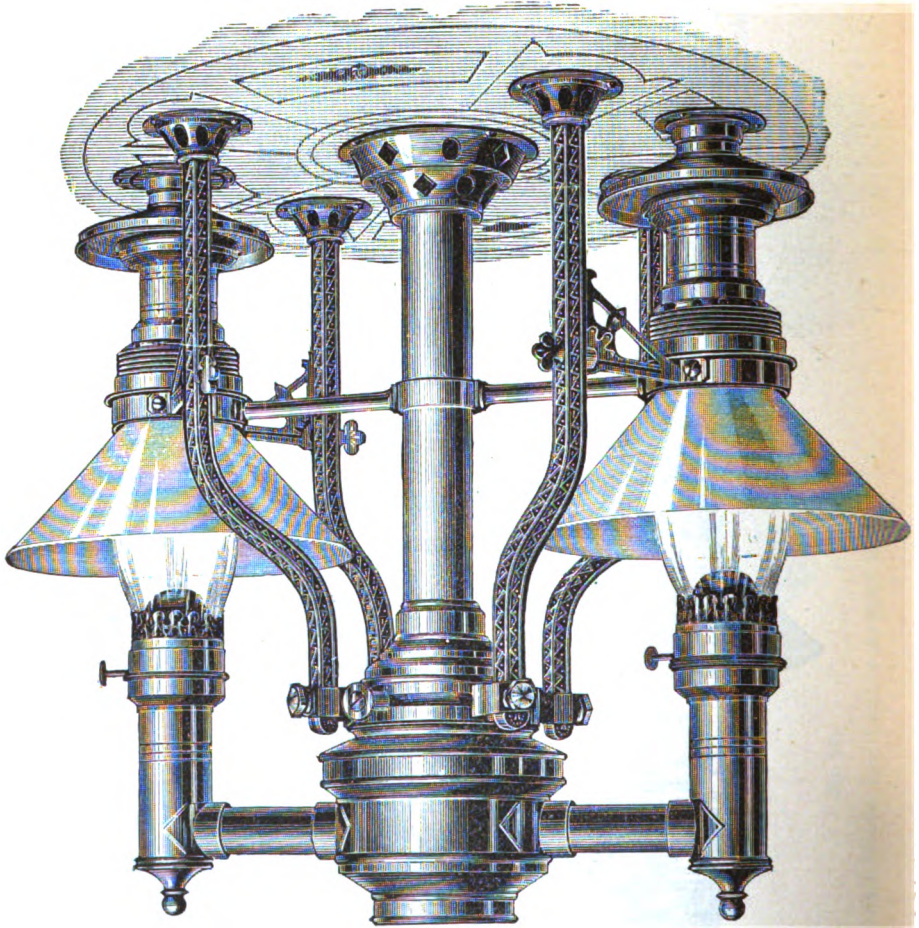


Fig. 270.

Porcelain shades, center four, dual burners. Drop 22½ or 24 inches as desired.

Three and four light Chandeliers of the “Tornado” pattern furnished if desired.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

FRESNEL BOW LIGHT.
(English Regulation.)



Fig. 271.

FRESNEL SIDE LIGHT.
(English Regulation.)



Fig. 272.

FRESNEL SIDE LIGHTS.—English Regulation.
GALVANIZED IRON. JAPANNED TIN.

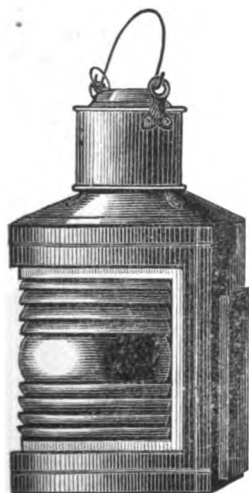


Fig. 273.



Fig. 274.

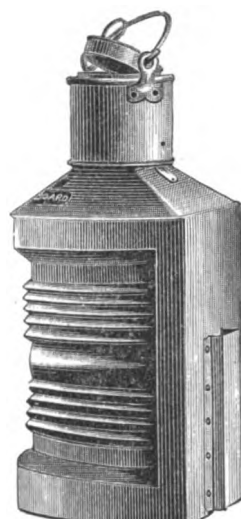


Fig. 275.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

SIDE LIGHTS.

FRESNEL No. 4.

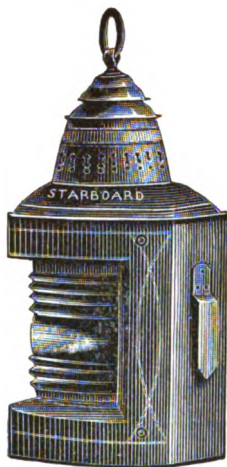


Fig. 276.

REGULATION, PLAIN GLASS.



Fig. 277.

JAPANNED, FRESNEL No. 1.

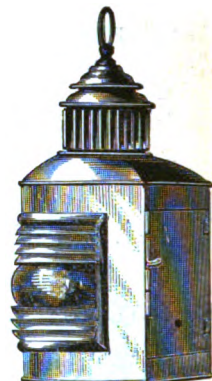


Fig. 278.

JAPANNED, FRESNEL No. 2.



Fig. 279.

JAPANNED, FRESNEL No. 3.



Fig. 280.

Galvanized Iron, Fresnel No. 2.



Fig. 281.

JAPANNED, PLAIN GLASS No. 3.



Fig. 282.

YACHT.



Fig. 283.

JAPANNED, PLAIN GLASS No. 2.



Fig. 284.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

8 in. Mast Head Light, plain globe.

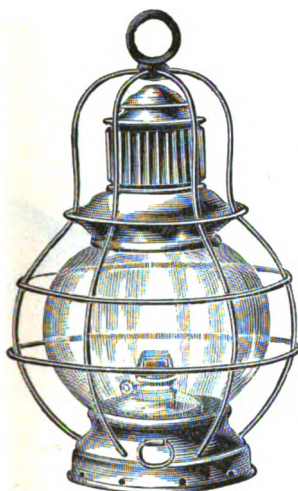


Fig. 285.

8 in. Mast Head Light—Fresnel

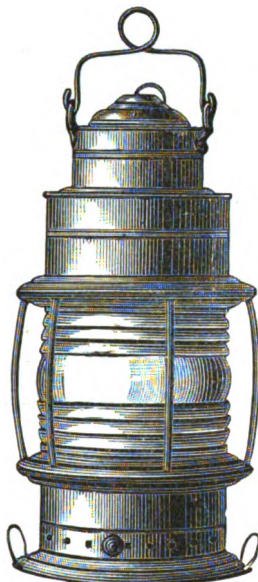


Fig. 286.

Smack Lantern—Japanned Tin.

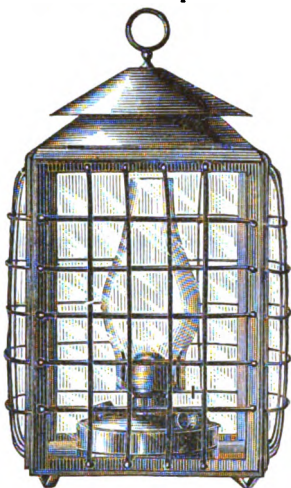


Fig. 287.

4 1/2 in. Mast Head Light—Fresnel

6 in. Mast Head Light—Fresnel.

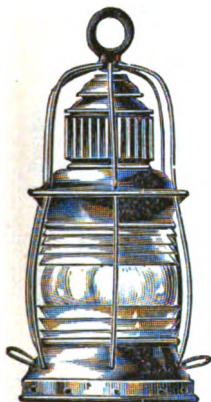


Fig. 288.

Triangular Lantern—Japanned Tin.

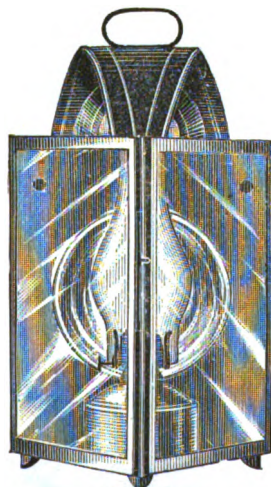


Fig. 290.

SIZES.

9x13.....inches.
10x14....."
12x16....."



Fig. 291.

Square Binnacle Light and Stand—Brass.



Fig. 289.

Triangular Lantern—Japanned Iron.

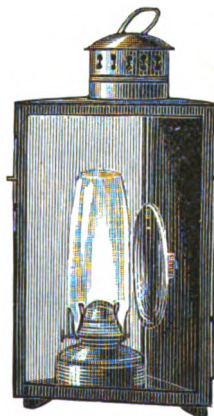


Fig. 292.

8x12 inches.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

GERMAN STUDENTS' LAMP.

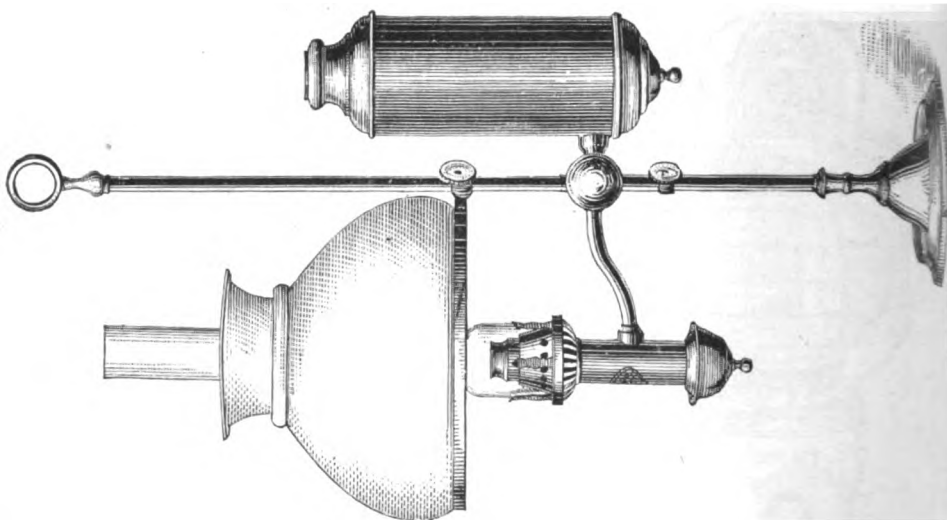


Fig. 293.

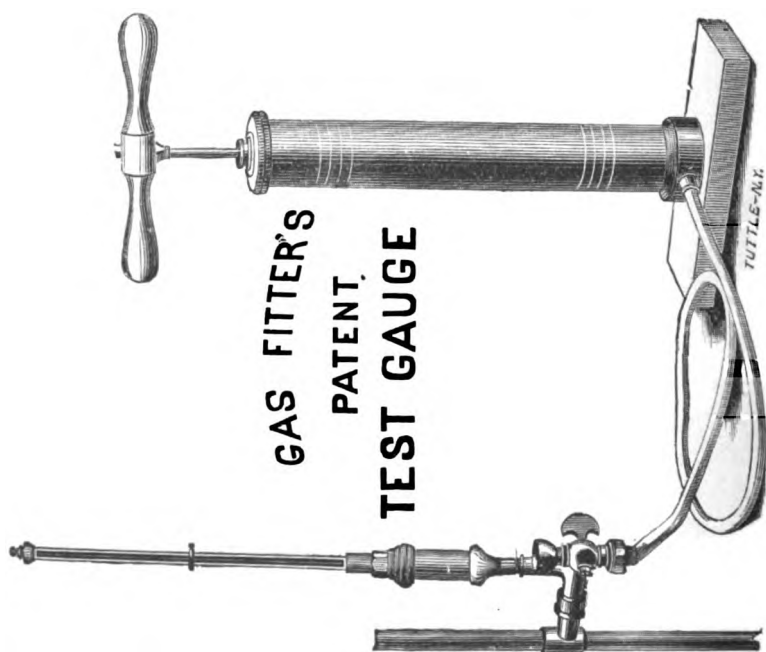


Fig. 294.

Fitted with Mercury Column as shown, or with spring gauge if preferred.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

STREET LAMPS.

Austin's New York pattern, with porcelain dome, reflector and hinged top.

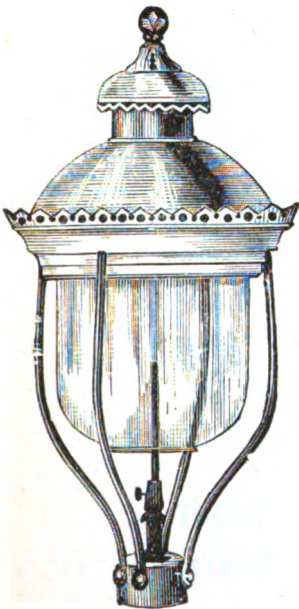


Fig. 295.

These Lamps furnished if desired with socket for wooden post, also with kerosene lamp and side or top hanger.

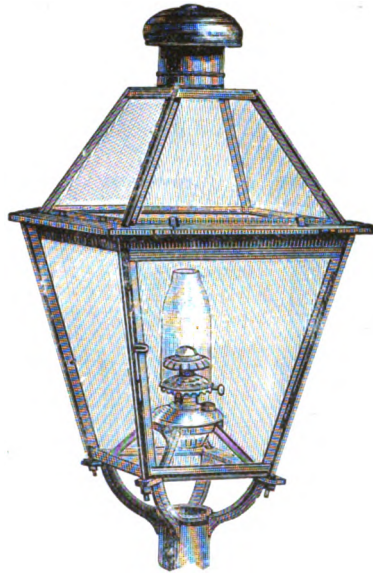


Fig. 296.

Corporation Street Lamp (old style),
for kerosene.



Fig. 297.

Tubular Street Lamp.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

The "Davy" Miner's Safety Lamps.

Best Clanney. Common Clanney. New Castle Improved Lock. Stephenson. Fireman or Davy.

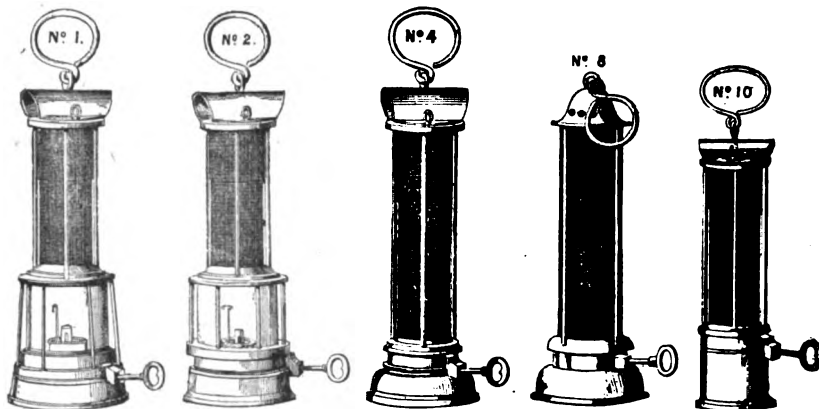


Fig. 298.

Miners' Hat Lamp.

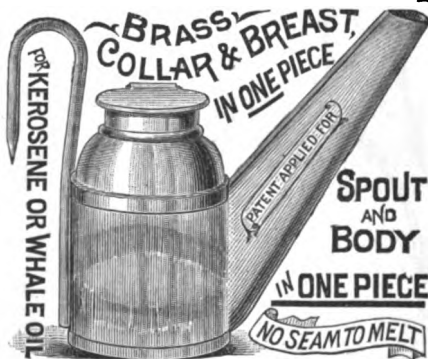


Fig. 299.

Metal Stamping, Cutting and Blanking.

Brass and Composition Castings.

Orders taken for any Description of Metal Spinning.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

OILS.

Machinery, Cylinder, Burning, Lard, Whale, Sperma, Paraffine, West Virginia and every other grade furnished by the gallon or barrel at lowest market rates. Tar, Pitch, Rosin, etc., also at market prices.

COTTON WASTE.

In 50, 100, 150 or 500 lb. bales.

GRADES—WHITE.

No. 1 Cop. Extra, No. 1 and B Machined Cop

GRADES—COLORED.

No. 1 and No. 2, Machined Cop.

COTTON LAMP WICK

In any quantity.

HAIR FELTING

For covering steam pipes and boilers, $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch thick

All hair, or hair with wool or canvas back.

MINERAL WOOL

In bags of about 75 pounds, ordinary or extra.

ASBESTOS MATERIALS.

Mill Board, Sheathing Paper and Flooring Felt. Refined Loose Fibre, Wick, Rope and Steam Packing.

Asbestos Fibre Cement, with or without wire netting, for covering steam pipes and boilers.

These materials will be furnished in any quantity, or we will furnish estimates for the material put on.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

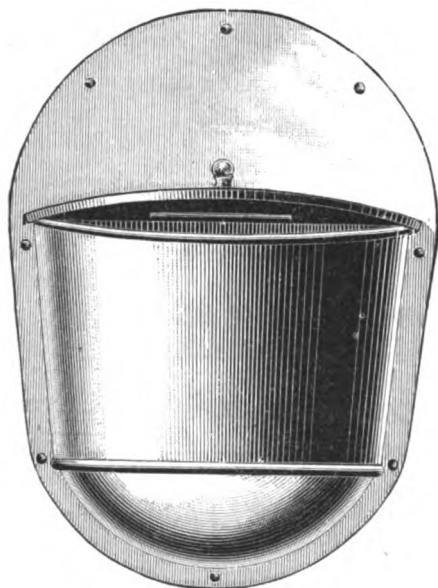
Sheet Brass Pocket for Cotton Waste.

Fig. 300.

Sizes 3 x 6, 3½ x 7, 4 x 8 inches.

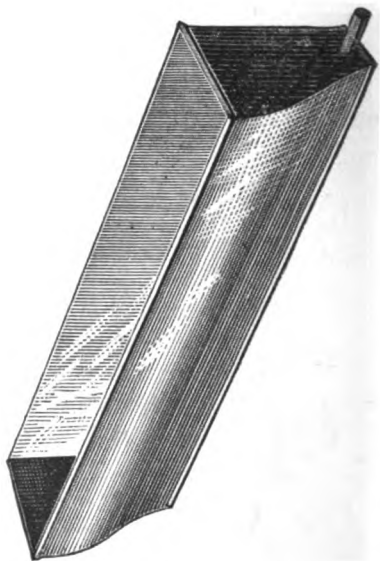
Gauge Cock Drip.

Fig. 301.

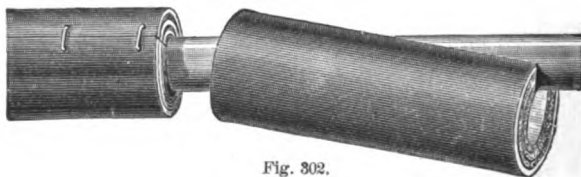
Toop's Patent Removable Steam Pipe Covering.

Fig. 302.

For Pipe from ¼ to 12 inches diameter.

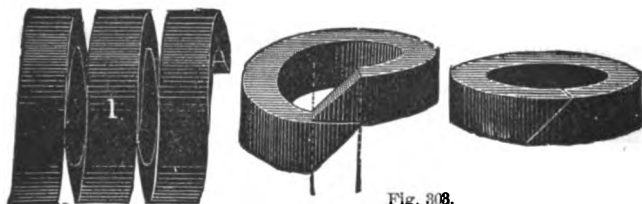
JENKINS' PATENT PACKING.

Fig. 303.

THE SIMPLEST. THE MOST DURABLE. THE CHEAPEST. THE EASIEST APPLIED.

Composed of refractory materials, specially selected for their heat-resisting qualities and their ability to withstand the action of acids and destructive fluids. The above cut represents the valve stem packing, it is also made in sheets and in valves for pumps.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Patent Corrugated Copper Packing.

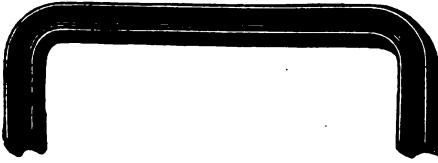
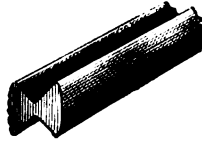
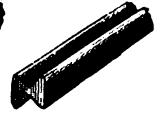


Fig. 804.



No. 1.



No. 2.

Fig. 805.

Cuts show the Corrugated Wire Packing, as sold in bundles.

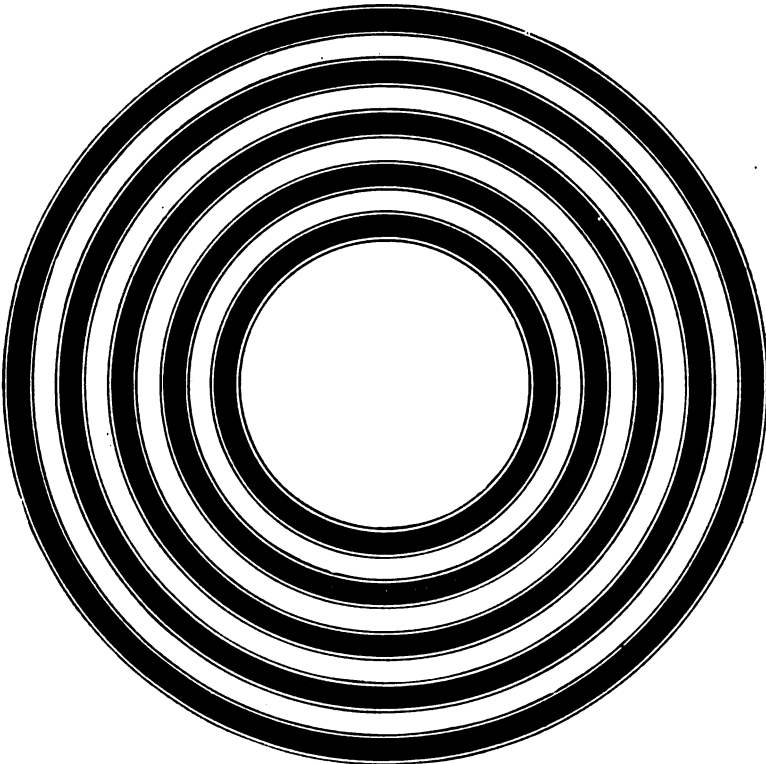


Fig. 806.

Cut shows Gaskets, as sold ready for use, from $\frac{1}{8}$ inch to 17 inches.

For Steam Engines, Water Pipes, Gas Pipes and pipes of every description it has no equal. The joints will not leak, and the Gasket will not burn out, neither can it be blown out.

IT WILL LAST AS LONG AS THE MATERIAL IT CONNECTS.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

STEAM PACKINGS.

Selden's Patent Packing, made of prepared paper, and with elastic rubber or paper core. Put up in small coils.

American Patent Combination Packing, self-lubricating, composed of well-known substances, applied to linen fabric, wound spirally around a cotton or rubber core, the Packing being coated outside and inside alike, making a Metallic Packing. With rubber or cotton core. Put up in small coils.

American Anti-Friction Packing.—The materials of which this Packing is composed are perfectly free from grit, and are lubricants of themselves. The anti-friction qualities are due principally to the mineral constituents with which it is charged, which, added to the excellent quality of the stock and the thorough manner in which it is made, make it a very desirable Packing.

Phoenix Packing, composed of hemp and lubricants, as plumbago, asbestos and talc. Made with white or black gum or hemp core.

Manhattan Packing, composed of materials similar to those used in the "Phoenix."

Hydraulic Packing, for water, composed of hemp, pitch, tallow, etc

Eagle Packing, composed of hemp, covering a composition of talc, plumbago and talc.

EXTRA QUALITY ITALIAN HEMP PACKING.

RUSSIAN HEMP PACKING.

AMERICAN HEMP PACKING.

JUTE PACKING.

COTTON PACKING.

SOAPSTONE PACKING.

MICA PACKING.

TUCK'S PISTON PACKING, round and square.

ELASTIC-BACK PISTON PACKING, square.

SHEET RUBBER PACKING, cloth insertion, and on one or two sides, from $\frac{1}{8}$ to $\frac{1}{4}$ inch thick.

FIBROUS GASKETS AND RINGS.

PURE GUM SHEETS, VALVES, GASKETS AND RINGS.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

Watchman's Improved Time Detector,

WITH SAFETY LOCK ATTACHMENT.

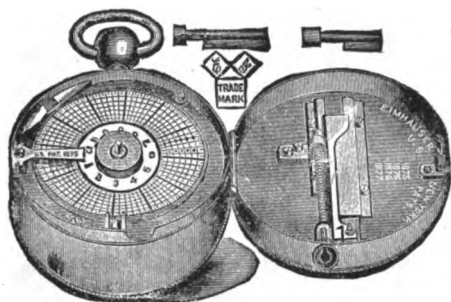


Fig. 307.

As seen in the above cut, twelve different keys are represented. Nos. 1 to 6 mark between the circles, 1, 2, 3, 4, 5, 6, on a paper disk, which is slowly revolving; the remaining six other keys, Nos. 7 to 12, make a figure on the line of the circle, so that one does not conflict with the other. Watch Clocks pricking holes are not reliable, and generally confusing.

THE SAFETY LOCK ATTACHMENT is an important recent invention, because it prevents dishonest Watchmen from opening the Watch with false keys and marking the dials without making their rounds. It is provided with an additional stationary marker (little knife in the cover) which marks the dial in the outside circle, showing at once any attempt of the Watchman to open the Watch.

In these instruments, the Marking Apparatus is in the cover of the case, the watch movement is separate, and, therefore, safe from dust entering the key-hole.

On the different stations of the Watchman's beat keys are fastened to indicate the stations up to 12 or more.

The Watchman in the evening receives the Watch locked in the pouch, provided with a fresh paper dial, wound up on the arbor in the center of the disc to the right, and will run about 65 hours. The middle prong of the fork represents the hand. In placing the dial, it should be put as near as possible to the correct time.

In making his rounds, the Watchman, on arriving at the station, will insert the key through the key-hole and turn it around to the right once, and upon so doing a figure will be punched on the dial at the minute the hand on the watch indicates.

The person in charge of the Watch, upon receiving it in the morning from the Watchman, can see in a moment how often and when the rounds were made during the night, whether every station has been visited, every time, as instructed or not.

These Watch Clocks are as reliable as the best lever watch, and are warranted, in every case, to be in perfect and complete order, and any trusty watchmaker can clean and repair them.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HOSE AND FIXTURES.

Rubber Conducting Hose, two-ply, for light pressure ; internal diameter, from $\frac{1}{2}$ to 10 inches. **Rubber Hydrant Hose**, three-ply, for 75 lbs. pressure; internal diameter, from $\frac{1}{2}$ to 4 inches. **Engine Hose**, four-ply, for 150 lbs. pressure; internal diameter, from $\frac{1}{2}$ to 4 inches.

Five and six-ply made to order.

Steam, Oil, Tanners', Air Brake and Brewers' Hose, three, four, five and six-ply; internal diameter, from $\frac{1}{2}$ to 3 inches.

Steam Hose, wrapped with marline.

Hose for Steam Fire Engines, and purposes where great pressure is required. **Excavating, Submarine and Tank Hose** furnished at short notice.

Rubber Suction Hose, on spiral brass or iron wire, $\frac{3}{4}$ to 2 inches diameter.

Large Suction Hose, on galvanized spiral wire, $2\frac{1}{2}$ to 12 inches diameter.

Smooth Bore Rubber Suction Hose, 2 to 12 inches diameter.

Hard Rubber Suction Hose, 1 to $2\frac{1}{2}$ inches diameter.

Rubber Tubing, pure gum or with cloth insertion, $\frac{1}{8}$ to 1 inch diameter, in 12-foot lengths.

Valve Balls. Linen Hose, seamless, plain, $\frac{1}{2}$ to 12 inches ; rubber lined, $1\frac{1}{4}$ to 33 inches; paraffined, 1 to 12 inches.

Cotton Hose, mildew and rot-proof, sizes $1\frac{1}{2}$ to $2\frac{1}{2}$ inches.

Leather Hose, best oak tanned, short lap, 1 to $2\frac{1}{2}$ inches.

Leather Play or Branch Pipes, double handles on side, 24 to 40 inches in length.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HOSE FIXTURES.

PLAIN HOSE PIPE, SCREWED OR SOLDERED TIPS.

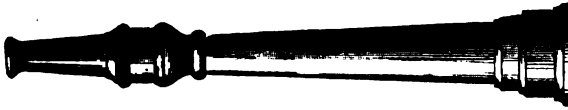


Fig. 308.

The screw tip pipe of this pattern is only made $\frac{3}{4}$ and 1 inch.

Size pipe	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$2\frac{1}{2}$ inches.
Length.....	8	9	10	$10\frac{1}{2}$	11	12	20 "

HOSE PIPE, SCREW TIP, COCK ON SMALL END.

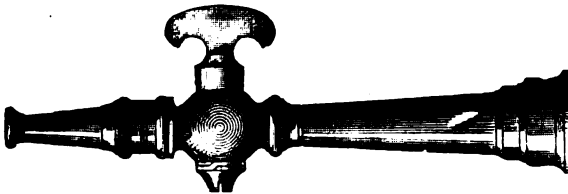


Fig. 309.

Size pipe.....	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$ inches.
Length.....	8	10	—	— "

HOSE PIPE, SCREWED TIP, COCK ON LARGE END.



Fig. 310.

Size pipe.....	$\frac{3}{4}$	1 inches.
Length.....	8	10 "

The lengths given above are for the "short" pattern. We also make a long pattern. See price list.

HOSE NOZZLE, TO WIRE ON.

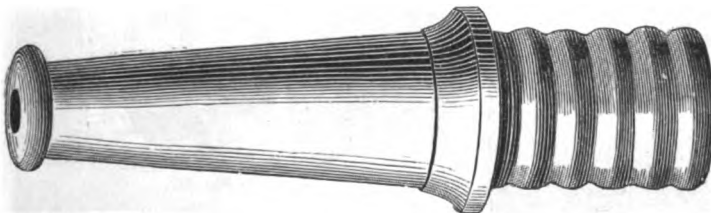


Fig. 311.

Size pipe.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$ inches.
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22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HOSE FIXTURES.

THE "BOSS,"

Hose Pipe and Sprinkler Combined.

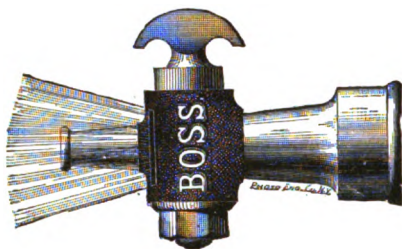


Fig. 812.

Sizes..... $\frac{1}{4}$, 1 in.

HOSE COUPLING.

For Rubber Hose.

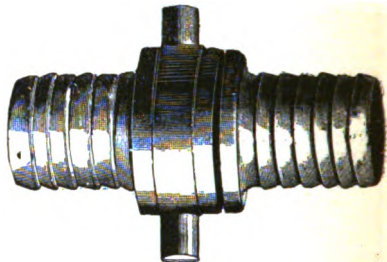


Fig. 813.

Sizes... $\frac{1}{4}$, $\frac{1}{2}$, 1, $1\frac{1}{2}$, $1\frac{3}{4}$, $2\frac{1}{2}$, 2, $2\frac{1}{2}$, $3\frac{1}{2}$, 3 in.

DOUBLE FEMALE COUPLING.

For connecting two male ends of hose coupling.

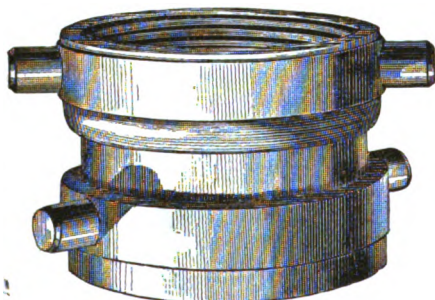


Fig. 816.

Size..... $2\frac{1}{2}$ inches.

HOSE COUPLING.

With Clamps for rubber hose.

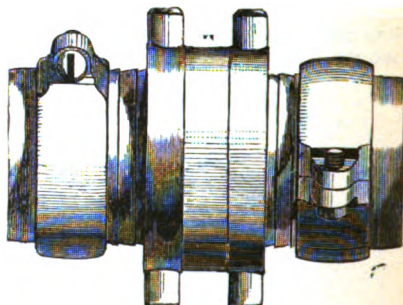


Fig. 815.

Sizes..... $2\frac{1}{2}$, $2\frac{3}{4}$, 3 inches.

HOSE COUPLING.

With Bands for Linen or Leather Hose.

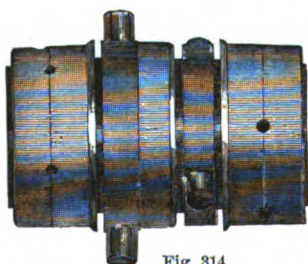


Fig. 814.

Sizes..... $1\frac{1}{4}$, 2, $2\frac{1}{2}$, $2\frac{3}{4}$, 3 in.

WORK'S PATENT HOSE COUPLING.



Fig. 817.

These Couplings are put on with an expanded ring, and leave the full area of the pipe clear.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

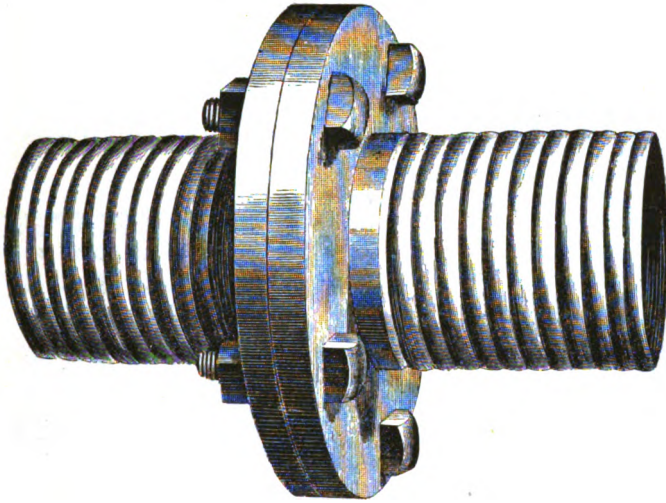
HOSE FIXTURES.**IRON FLANGE COUPLING FOR SUCTION HOSE.**

Fig. 318.

Sizes..... $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6, $6\frac{1}{2}$, 7, $7\frac{1}{2}$, 8 inches.

HOSE NIPPLE.

One end to fit hose thread, and the other to fit iron pipe.



Fig. 320.

Sizes..... $\frac{1}{4}$ to 4 inches.

HOSE SPRINKLER.

Small, medium and large.



Fig. 319.

Size..... $\frac{1}{4}$ inch.

HOSE CAP—WITH CHAIN.

Fig. 321.

Sizes..... $\frac{1}{4}$ to $2\frac{1}{2}$ inches.

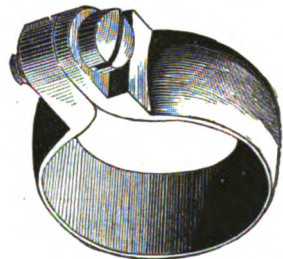


Fig. 322.

Sizes..... $\frac{3}{4}$ to $2\frac{1}{2}$ inches.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HOSE FIXTURES.

IRON STRAINER FOR IRON PIPE.

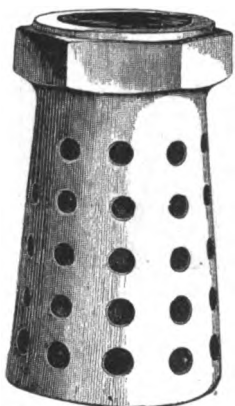


Fig. 823.

Sizes.....1 to 8 inches.

BRASS SUCTION BASKET.

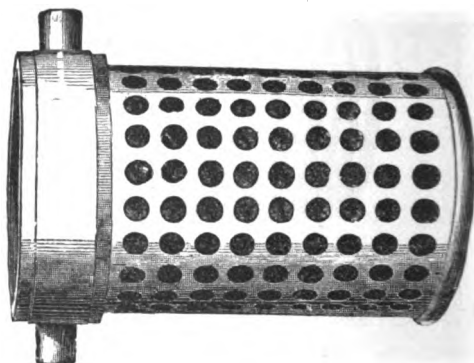


Fig. 824.

Sizes.....1½ to 8 inches.

SIAMESE CONNECTIONS.

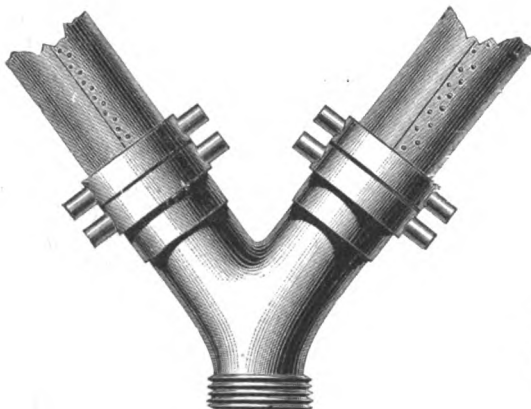


Fig. 825.

For combining two streams.

Size.....2½ inches

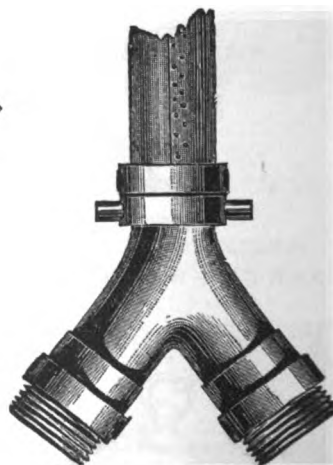


Fig. 826.

For dividing one stream.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HOSE REELS.

Nos. 3 and 4.

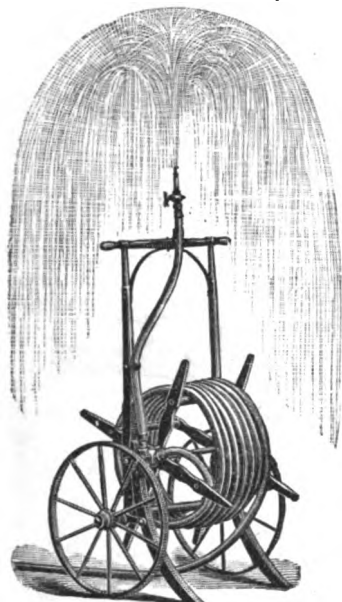


Fig. 327.

No. 2.

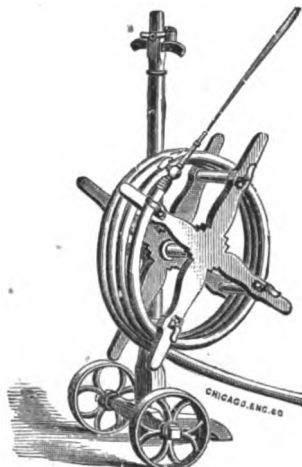


Fig. 328.

No. 2 will hold 75 feet $\frac{3}{4}$ hose.

" 3 " 150 " " "

" 4 " 200 " " "

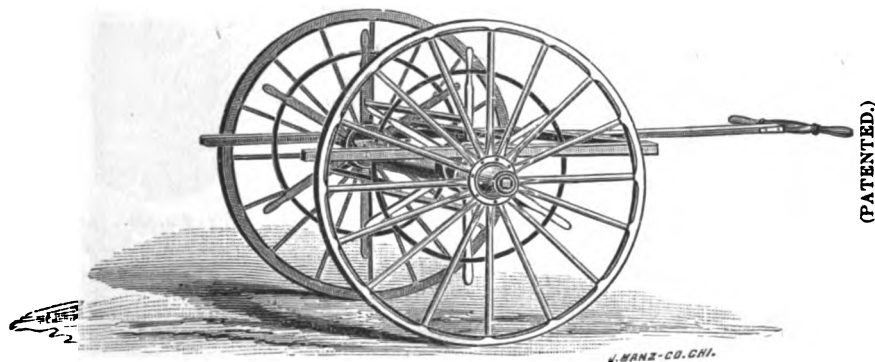
**THE FOUNTAIN WAREHOUSE HOSE CARRIAGE,
PORTABLE.**

Fig. 336.

This Carriage has been designed to meet a want long felt for a cheap, strong, portable vehicle for conveying hose for factory purposes, and has the advantages over a stationary reel, in the fact that it can be removed from place to place. It has a strong wooden frame, is thoroughly braced with iron, and is constructed so that the frame tilts up out of the way; thus it occupies, when at rest, the least possible space. A strong iron shaft extends across through the drum, and is firmly bolted to the sides of the frame, constituting an efficient brace, so that the rear may be left open to allow free access to the reel. It will carry 250 feet of rubber hose, or 500 feet of linen hose, and is admirably adapted for use in mills, factories, etc.

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FOR PRICES SEE ACCOMPANYING LIST

ROLLER TUBE EXPANDER.

Sizes.....1 to 7 inches.

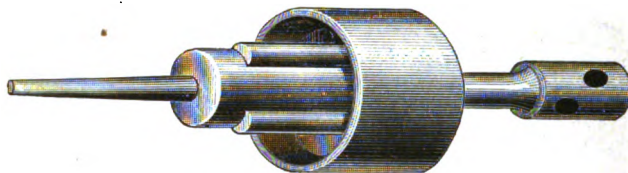


Fig. 830.

COLLINS' TUBE EXPANDER.

Sizes..... $1\frac{1}{4}$ to 4 inches.



Fig. 831.

SPRING TUBE EXPANDER.

Sizes.....1 to 7 inches.



Fig. 832.

SPRING TUBE EXPANDER.**RING PATTERN.**

Fig. 833.

FERRULE FOR MENDING LEAKY TUBES.

Fig. 834.

In ordering Spring Expanders always give thickness of tube sheet.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

BOILER TUBE BRUSHES.

STEEL WIRE BRUSH

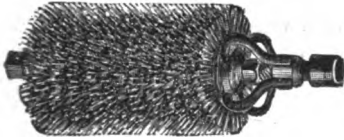


Fig. 835.

Sizes, 1 to 6 inches.

**SPIRAL
STEEL WIRE.**

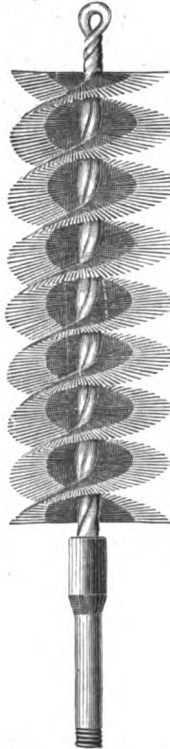


Fig. 837.

Sizes, 1 to 24 inches.

**SPIRAL
WHALEBONE**

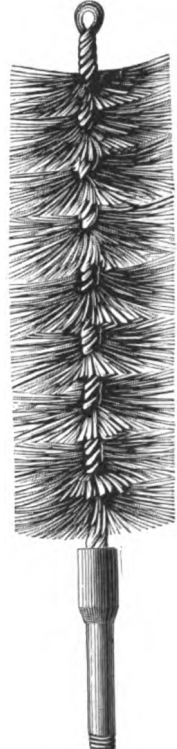


Fig. 838.

1 to 6 inches.

STEEL WIRE BRUSH.

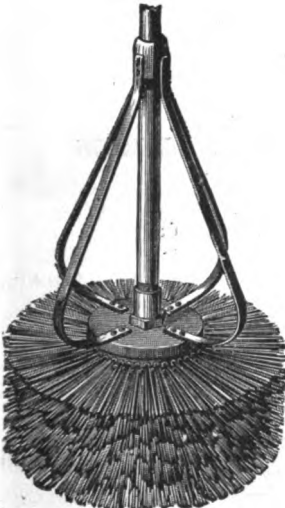


Fig. 836.

Sizes, 6 to 24 inches.

STEEL COIL WIRE BRUSH AND FLEXIBLE TUBE SCRAPER COMBINED.

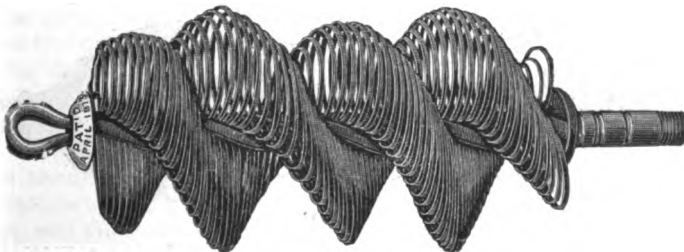


Fig. 839.

Sizes, 1 to 4 inches.

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FOR PRICES SEE ACCOMPANYING LIST.

ELLIPTIC TUBE SCRAPER.

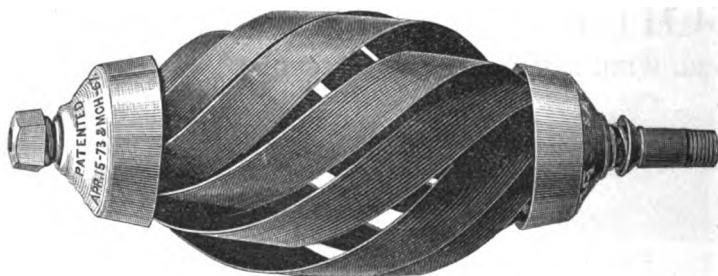


Fig. 340.

Sizes..... 1 to 4 inches.

PRATT'S ELASTIC TUBE SCRAPER.

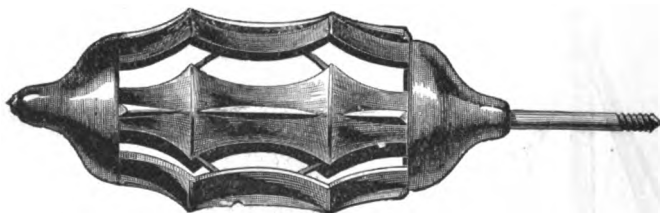


Fig. 341.

Sizes..... 1 to 4 inches.

NATIONAL STEEL TUBE SCRAPER.

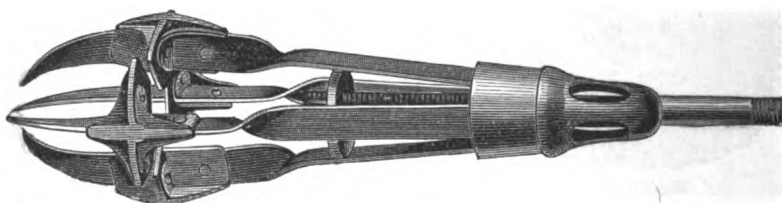


Fig. 342.

Sizes..... 1 to 5 inches.

DOUBLE-HEADED ADJUSTABLE TUBE SCRAPER.

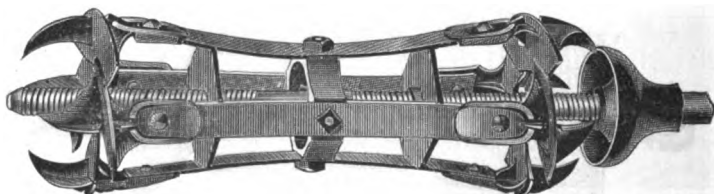


Fig. 343.

Sizes..... 1 to 6 inches.

Boiler Tubes are always measured outside; we shall, therefore, when not otherwise instructed, understand orders to refer to the OUTSIDE DIAMETER of the tube.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Excelsior Steel Tube Scraper.

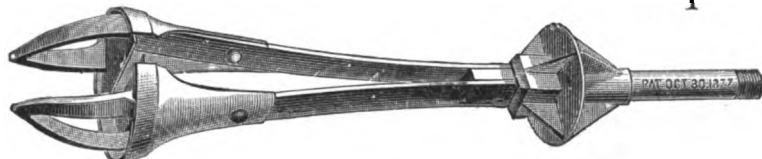


Fig. 344.

Sizes, $1\frac{1}{4}$ to 6 inches.

The Excelsior Tube Cleaner is manufactured of Cast Steel, hardened and tempered in such a manner as to stand such friction and wear as may be brought upon it; its two sections being kept upon the surface of the Tube, by properly hardened and tempered adjusted springs, and the one section overlapping the other (as seen in the cut), prevents the loosened Scale from passing back of the Cleaner.

Patent Tube Cutter.

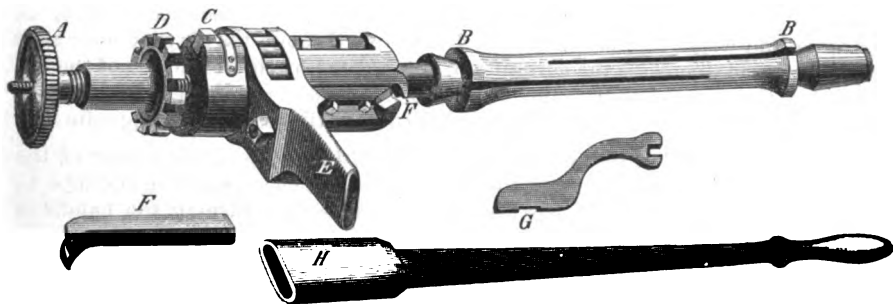


Fig. 345.

This tool is intended for cutting off the ends of boiler tubes, after they have been placed in the boiler and expanded on one end.

Directions for Operating the Cutter.

Place it inside the tube, leaving about half an inch between the cutters and the end of the tube, with the feed wheel D even with the end of the shaft, giving the whole length allowed for feeding up to the tube while cutting; screw up the hand-wheel A on the tightening bolt till the sleeve B is expanded in the tube, sufficiently to hold the tool firm and steady; turn the feed wheel till the cutters touch the end of the tube, then draw the sliding feed bar C in contact with the feed wheel; place the lever H on the shank E, and cut till the stop F on the cutter touches the tube sheet; then draw the sliding feed bar out of contact with the feed wheel, and turn the feed wheel back to its first position, or even with the end of the shaft, and unscrew the handwheel to remove the cutter to the next tube.

The cutters should be sharpened on the inside, and retain the same angles as when new, and must be set by the gauge G on the end of the wrench.

SIZES.

No. 1, to cut 2 inch to $4\frac{1}{2}$ inch tubes. No. 2, to cut $1\frac{1}{4}$ inch to $2\frac{1}{4}$ inch tubes.

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FOR PRICES SEE ACCOMPANYING LIST.

STEAM BOILER TUBE CLEANER.

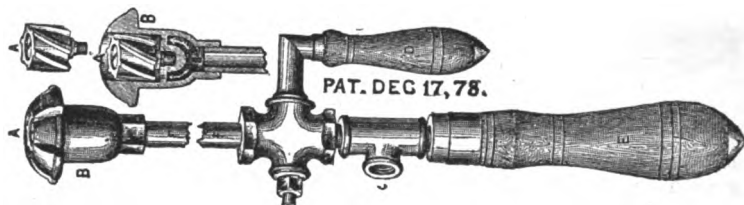


Fig. 346.

POINTS OF SUPERIORITY.

1st. *The peculiar manner in which Steam is introduced into the tube,* which is in a rapidly revolving screw-like form, caused by the great velocity of the spiral fan-wheel A, and the air which is drawn through the air spaces, or slots in the rosehead, increases the current which is created by the revolution of the fan collecting the accumulated sediment in the flue, and causing it to revolve with increasing speed and force as it traverses the tube, until ejected at the opposite end.

2d. *The general construction of the Machine.*—The arrangement of the handle D and cock are such that the operator can, on changing from one tube to another, relieve the rosehead from all pressure by simply turning the handle of the stop-cock.

3d. *The Durability and Effectiveness of the Machine,* which, if handled and attended to with ordinary care, will last for many years. Again, the engineer or fireman can easily clean out more tubes in one hour with it than with the ordinary tube brush or scraper in eight hours; and as the action of the steam passing from the Tube Cleaner into the tubes completely moistens the sediment and dirt, and prevents it from rising and flying about in all directions, the work which heretofore has been so disagreeable can now be done with comfort, and the operator keep himself entirely free from dirt.

4th. *The readiness with which it can be applied.*—At any time during the day it can in a moment be used by attaching the rubber tube to any one of the steam cocks which are usually to be found in all boilers, and the entire operation on a boiler with 100 tubes will take but, say, 15 to 20 minutes.

5th. *Economy in Fuel.*—By a daily use of the machine the tubes are kept so thoroughly clean that a saving of fuel will be effected, ranging from 10 to 20 per cent.

SIZES :

Number.....	1	2	3	4	5
For Tube.....	1½ & 1¾,	2 & 2½,	2½ & 2¾,	3 & 3½,	3½ & 4 inches outside.

In ordering state what style of boiler you have, and whether you require the hose, couplings and extension pipe "F" (see cut).

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PATENT CONDENSER HEAD

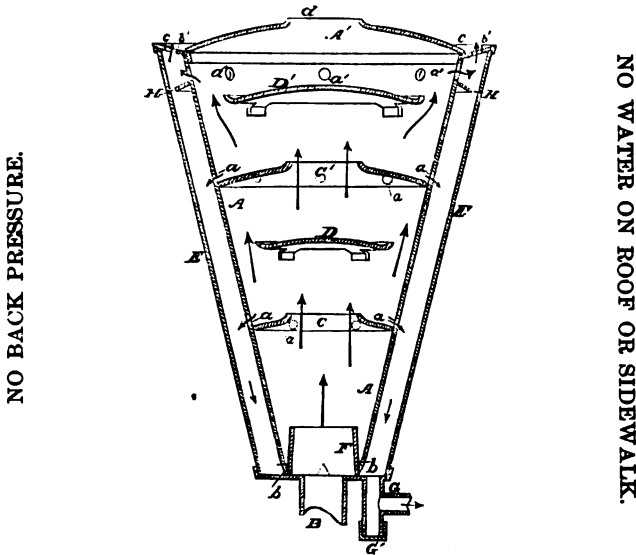


Fig. 347.

Sizes, for exhaust pipes, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 inches.

For Exhaust Steam Pipes.

This Head can be used on all Exhaust Pipes, as it keeps the roof perfectly dry, and avoids spattering of pavements and buildings with water.

DESCRIPTION OF FIGURE 347.

A, represents a hollow body or shell, which is adapted to be attached to a pipe B for exhaust steam from any source.

Within the shell are secured opened and closed deflectors CC' , DD' , which are arranged alternately one above the other, and in the wall of the shell are openings a , which are adjacent to the place of connection of the opening deflectors within the wall, said openings communicating with a jacket E which surrounds the shell.

The deflectors are dishing upwardly, so that their highest points are at the centre, and the top A' of the shell is also dishing and open at its centre.

At the base of the shell is secured an upright pipe F , surrounding which at the extreme lower end is a series of openings b which communicate with the jacket E , the bottom of the latter being closed excepting at the place of connection of the discharge pipe G .

H represents a guard, which is secured to and projects from the exterior of the shell A , near the upper end thereof, so as to partly close the space of the jacket E , the top of the latter being covered by a perforated plate c .

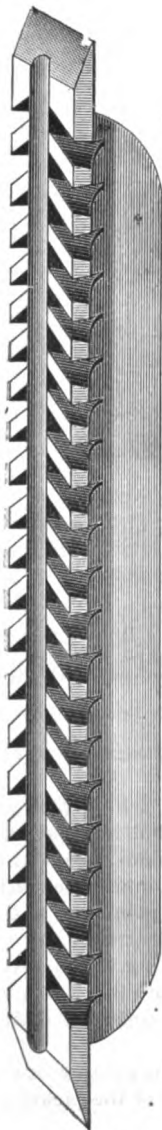
22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE KEYSTONE GRATE BAR,

(PATENTED).

For Steamship, Stationary, Wood-Burning, Locomotives and other Furnaces.



FOR BURNING FUEL OF ALL KINDS, FROM
COAL OR COKE DUST, TO STEAMSHIP
LUMP COAL, WOOD, SAWDUST,
TAN-BARK, Etc., Etc.

Guaranteed to make steam with **LESS FUEL, LESS LABOR**
and in **LESS TIME** than any other, and to be the most durable
and cheapest Grate Bar in the world.

Does not warp. Weighs less and gives more draft than any
other.

WE CLAIM FOR IT THE FOLLOWING ADVANTAGES.

- 1st. It has more air space than any other.
- 2d. It will not burn out and warp as others do.
- 3d. Fires may be cleaned with greater ease.
- 4th. It ensures more thorough combustion of fuel, and consequently makes more steam per pound of fuel.
- 5th. It necessitates no change of fire-place.
- 6th. It is made for all sizes of anthracite and bituminous coal, as well as for wood, sawdust, shavings and tan-bark.
- 7th. Its **FIRST COST IS LESS** than the **CHEAPEST** bar in the market.

SIZES AND WEIGHTS UPON APPLICATION.

Fig. 348.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Waters' Perfect Engine Governor.

Perfectly Suited to Every Variety of Portable and Stationary Steam Engines.

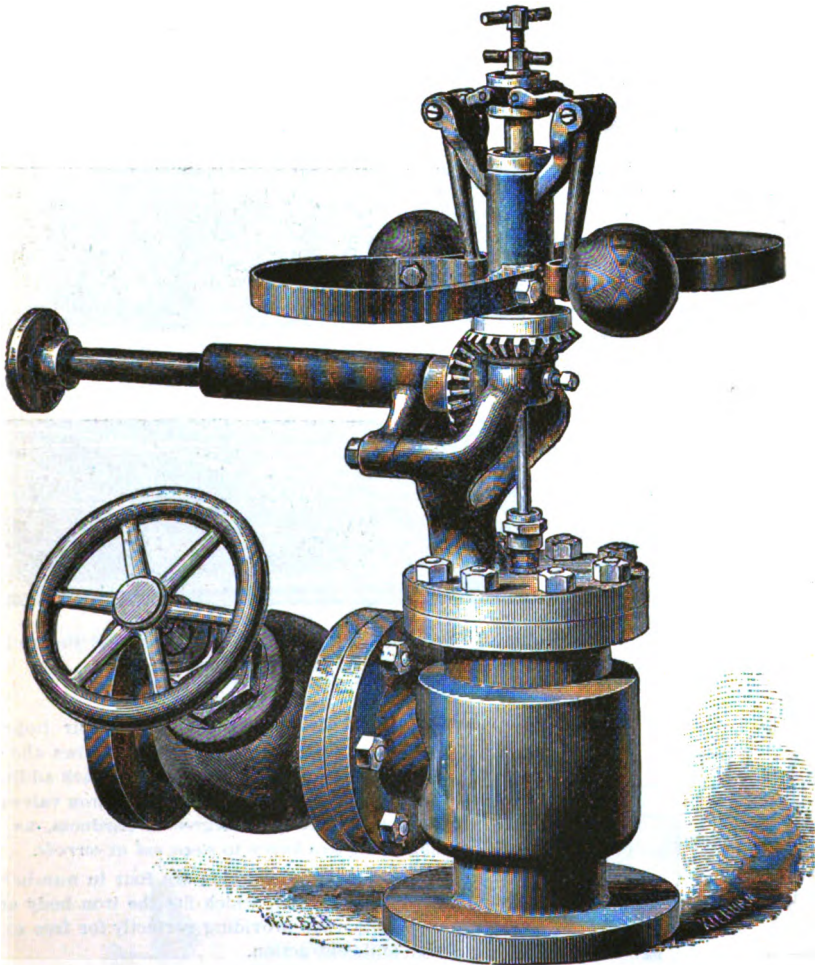


Fig. 349

FLANGED GOVERNOR WITH STOP VALVE.

This style is made $2\frac{1}{2}$ inches and larger.

These Governors have *adjustable speed* and *solid composition* valves and seats, and are furnished, if desired, with *Automatic Safety Stop* and *Sawyer's lever*.

(For description see page 116.)

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Description of Waters' Perfect Governor.

The Waters' Governor is too well known to require a detailed description. Its construction frees the joints of the arms from all friction and weight of the balls; the balls always revolve in the same plane without rising or falling, being supported by the springs, which replace the usual force of gravity. Our adjustable speed, which admits of the *widest* range of variation, is *far superior* to any other for *close* regulation, as a change of speed brings no extra resistance over the balls, and is not an extra charge as in the case of others. Having a valve of larger area than any other governor, light balls, springs and a medium high speed, they attain the highest degree of *economy and closest regulation* of any throttling governor in the market; and being extremely quick in its action, it is *especially* adapted to Saw Mills, Rolling Mills and Flouring Mills.

Fig. 350 shows a remarkable card taken from a saw-mill engine having on a 5-in. "Waters'" Governor, the work requiring within 10 lbs. of boiler pressure on the piston, and varied so as to produce three distinct adjustments of the Governor Valve during one-half stroke of the engine, the steam line being perfectly parallel with the air line after each adjustment.



Fig. 350.

Fig. 351 is a card taken from a rolling-mill engine having on a 10-in. "Waters'" Governor. The three steam lines indicate three successive strokes of the engine. The lower line was made without any work; the second was taken with the iron in the rolls until after the beginning of the third stroke, when the work left the rolls, as indicated by the dropping of the steam line.

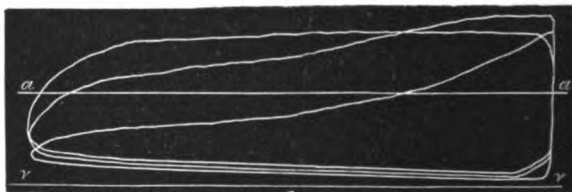


Fig. 351.

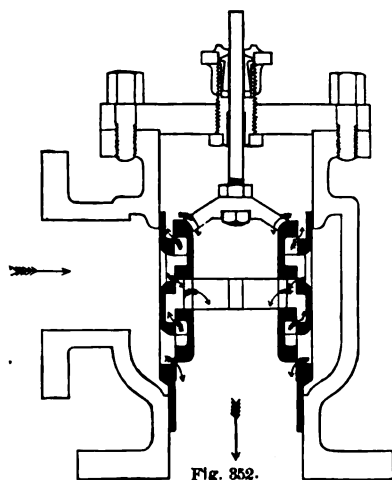


Fig. 352 shows a *sectional view* of our Improved Valve and seat. The black portion shows the composition metal, which is proving, by each additional year's use, its great superiority over iron valves and seats of any form or degree of hardness, as they have never been known to *steam cut* or *corrode*.

The Valve seats, which are four in number, are all in one casting, which fits the iron body at the ends *only*, thus providing perfectly for free expansion and contraction.

The Valve is so *thoroughly* balanced that we can use much larger diameters than any other makers, which give large openings for a small travel. This not only insures *extreme quick action*, but enables us to realize the nearest to full boiler pressure on the piston of any Governor in the market, as the indicator cards shown in Figs. 350 and 351 prove.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

WATERS' PERFECT ENGINE GOVERNORS.

COOKE & CO.

117

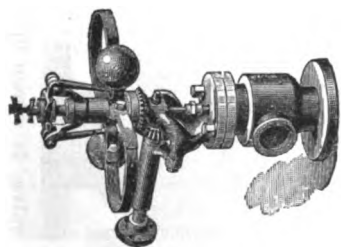


Fig. 353.

Style, including and below 2 inches, flanged base.

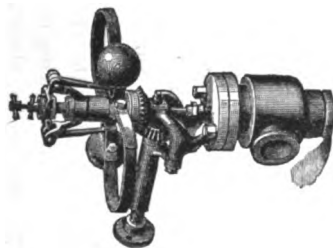


Fig. 354.

Style, including and below 2 inches, screw base.

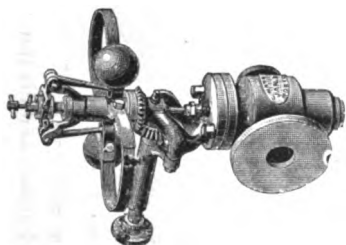


Fig. 355.

Style of Governor for Horizontal Steam Pipe, flanged or screwed, as desired.

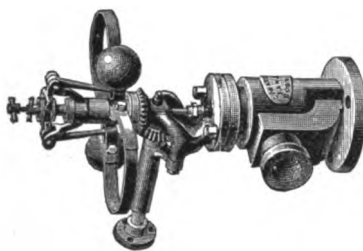


Fig. 356.

Style of Governor when bolted to the steam dome with side outlet either flanged or screwed.

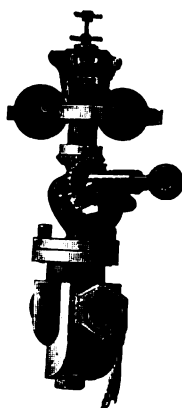


Fig. 357.

Fig. 357 shows the vertical governor used in a horizontal position. It is very often used in this way with entire satisfaction.



Fig. 358.

Fig. 358 shows the horizontal governor. It is equally as good as the vertical, but having fewer parts, is less expensive.



Fig. 359.

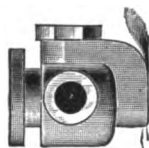


Fig. 360.

Figs. 359 and 360 show valve chambers suitable for either vertical or horizontal governors; furnished with one or both outlets screwed or flanged.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

WATERS' AUTOMATIC SAFETY STOP.

Figs. 361 and 362 show our improved Automatic Safety Stop, which is rapidly gaining the favor and confidence of the trade, having proved unfailling in action for the four years past, and being *entirely free* from the usual objections of *sticking* or *gumming*, so common and fatal to other styles.

Fig. 361 shows the revolving head resting on a disc fastened to the back of the gear, and the strain of the belt while on the pulley holds it in this position; but when the belt runs off or breaks, the weighted lever drops, throwing the shaft back out of gear, allowing the top to drop and close

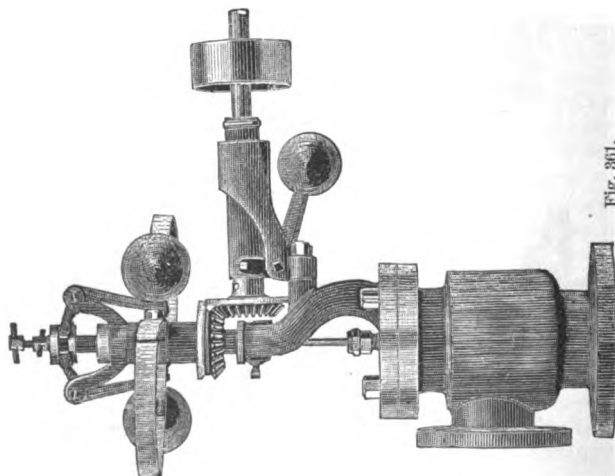


Fig. 361.

Fig. 362.

the valve, as shown in Fig. 362. To start again, simply raise the top part and lift the weighted lever into position, and hold it while putting on the belt. This device works equally well with either horizontal, vertical or angular belt, and *only* when the belt breaks or runs off; consequently *never use flanged pulleys*, which would prevent the belt going off.

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FOR PRICES SEE ACCOMPANYING LIST.

SAFETY CHECK AND SAWYER'S LEVER.

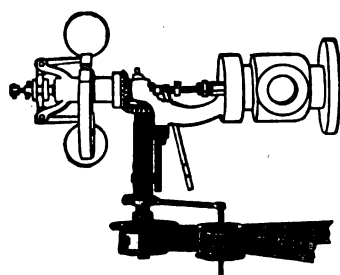


Fig. 363.

Safety Check or Stop Motion.	2	1 1/4
Size.....	..... 1 1/4	2

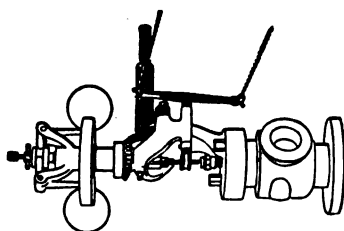


Fig. 364.

Sawyer's Lever.	1 1/4	2	2 1/4	3	3 1/4
Size.....	..... 1 1/4	2	2 1/4	3	3 1/4

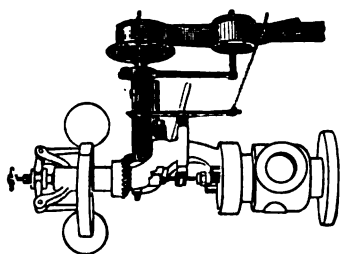


Fig. 365.

Combined Safety Check and Sawyer Lever.	1 1/4	2
Size.....	..... 1 1/4	2

Figs. 363, 364 and 365 show our improved Safety Check and Sawyer's Lever in its different forms. We have adopted this device in preference to others on account of its simplicity, feeling *confident* that it will fully meet the requirements of the trade for a positive and reliable safeguard on all engines requiring a two-inch governor, or smaller. This improvement is especially valuable to portable engines when threshing, where it is very desirable to simply *check* the motion of the engine when the governor belt breaks or runs off, instead of stopping suddenly, which leaves the threshing machine full of straw and the mill clogged with chaff and grain, causing serious delay in starting. This is a feature which no other governor has.

Fig. 363 shows the Safety Check or Stop Motion for small stationary engines.

Fig. 364 shows the Sawyer's Lever and Traction Engine Valve, which enables the engine to be controlled from a distance by cords.

This will, in many cases, save the cost of extra lever valve on traction engines; for with a cord in each end of the lever, it places the control of the engine in the hands of either the driver or fireman. This is a valuable feature for engines working in a hilly country or over bad roads. Fig. 365 shows both features in combination.

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FOR PRICES SEE ACCOMPANYING LIST.

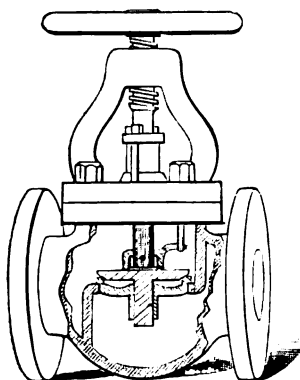


Fig. 366.

STOP VALVE.

Globe or Angle.

Sizes.....1½, 2, 2½, 3, 3½, 4, 4½, 5, 6 inches

DESCRIPTION.

The steam metal spindle has a heavy square thread of quick pitch, as shown in Fig. 366, which shows the superior style of composition valve and seat which we put in. The valve disc has a center guide below which keeps it true on the seat, so that the disc is easily ground in when the yoke is removed.

TABLE OF DISTANCES, Etc.

Side of Valve or Diameter of Steam Pipe.	Diameter of Cylin- der suitable for.	Extreme Height.	Diameter of space required.	Distance from Base of Steam Pipe.	Distance from cen- ter of Governor to Stop Valve.	Distance from cen- ter of Governor to end of Pulley Shaft.	Diameter of Base Plange.	Diameter of Stop Valve Plange.	Speed of Governor, Rev. per minute.	Diameter and face of Pulley pre- ferred.
1 in.	2 to 3 in.	10½ in.	5½ in.	2 in.	11 in.	6 in.	4 in.	6 in.	275	8 in.
1½ in.	3 to 4 in.	13½ in.	9 in.	2½ in.	12 in.	8 in.	4½ in.	7 in.	260	8 x 1 in.
2 in.	4 to 5 in.	16 in.	9 in.	3 in.	13 in.	8½ in.	5 in.	8 in.	240	8 x 1½ in.
2½ in.	5 to 6 in.	19 in.	10 in.	3½ in.	14 in.	9 in.	5½ in.	8½ in.	210	8 x 1½ in.
3 in.	6 to 7 in.	21 in.	14 in.	4 in.	15 in.	10 in.	6 in.	9 in.	200	8 x 1½ in.
3½ in.	7 to 8 in.	24 in.	18 in.	4½ in.	16 in.	11 in.	6½ in.	10 in.	200	8 x 1½ in.
4 in.	8 to 10 in.	28 in.	18 in.	5 in.	17 in.	11½ in.	7 in.	11 in.	150	8 x 1½ in.
4½ in.	10 to 12 in.	30 in.	22 in.	5½ in.	17 in.	12 in.	7½ in.	11½ in.	150	8 x 2 in.
5 in.	12 to 14 in.	34 in.	25 in.	6 in.	18 in.	12½ in.	8 in.	12 in.	150	8 x 2 in.
5½ in.	14 to 16 in.	36 in.	25 in.	6½ in.	19 in.	13 in.	8½ in.	12½ in.	125	8 x 2 in.
6 in.	16 to 18 in.	38 in.	25 in.	7 in.	20 in.	13½ in.	9 in.	13 in.	125	8 x 2 in.
6½ in.	18 to 20 in.	42 in.	34 in.	7½ in.	21 in.	14 in.	9½ in.	13½ in.	100	8 x 2½ in.
7 in.	20 to 28 in.	44 in.	34 in.	8 in.	22 in.	14½ in.	10 in.	14 in.	100	10 x 2½ in.
7½ in.	28 to 32 in.	44 in.	40 in.	8½ in.	23 in.	15 in.	10½ in.	15 in.	100	10 x 2½ in.
8 in.	33 to 36 in.	50 in.	40 in.	9 in.	24 in.	15½ in.	11 in.	15½ in.	100	10 x 2½ in.
8½ in.	36 to 40 in.	52 in.	40 in.	9½ in.	25 in.	16 in.	11½ in.	16 in.	100	12 x 3 in.
9 in.	40 to 44 in.	66 in.	48 in.	10 in.	26 in.	16½ in.	12 in.	16½ in.	100	12 x 3 in.
10 in.	40 to 44 in.	66 in.	48 in.	10 in.	26 in.	16½ in.	12 in.	16½ in.	100	12 x 3 in.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE PICKERING GOVERNOR.

ESPECIALLY ADAPTED FOR HIGH SPEED ENGINES.

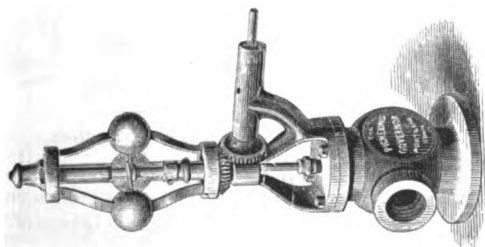


Fig. 367.

The Governor without any Attachments.

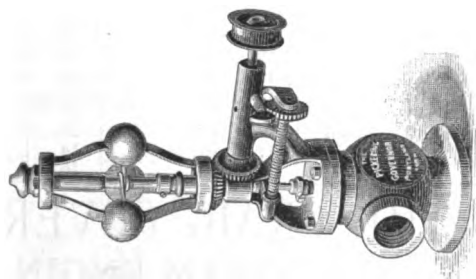


Fig. 368.

Shows the Speeder only.

The openings can be either flanged or screwed, as required.

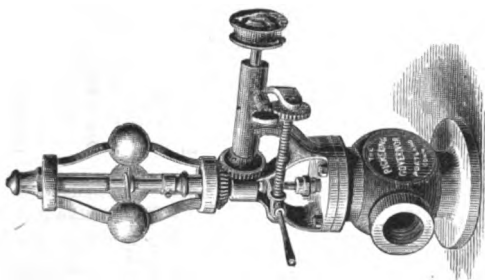


Fig. 369.

Shows the Speeder and Sawyer's Valve.

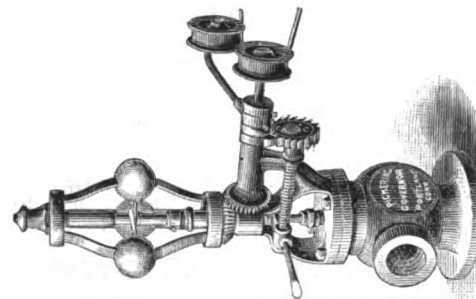


Fig. 370.

Shows the Speeder, Sawyer's Valve, and Stop Motion.

DESCRIPTION OF THE SPEED ADJUSTER.

The tension of a Spiral Spring is utilized for varying the resistance to the centrifugal force of the Governor Balls; the tension being adjusted by means of a Worm and Worm-wheel, which may be manipulated while the engine is in motion, thus adjusting the speed according to the requirements.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

Pickering's Horizontal Governor,

With Openings either Flanged or Screwed, and as shown in Cut, or with Angle Valve, same as Fig. 367.

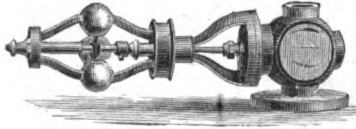


Fig. 371.

Distance from center of inlet to center of pulley.

$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 inch.
$5\frac{1}{2}$	$7\frac{1}{2}$	8	9	$9\frac{1}{2}$ inches.

LIST OF DIMENSIONS.

Size of Valve or Diameter of Steam Pipe.	Diameter of Cylinder suitable for.	Extreme Height.	Distance from center of Governor to end of Horizontal Bearing.	Distance from base of Governor to center of Steam Pipe.	Distance from center of Governor to Stop Valve.	Greatest Expansion of Balls.	Diameter of Base Flange.	Diameter of Side Flange.	Diameter of Pulley advisable,	No. of Revolutions per minute for Fig. 367.	No. of Revolutions per m. for Figs. 368, 369, 370.
INCHES.	INCHES.	INCHES.	INCHES.	INCHES.	INCHES.	INCHES.	INCHES.	INCHES.	INCHES.		
$\frac{1}{2}$	2 to 3	14	4	$1\frac{1}{2}$	$1\frac{1}{2}$	5	$3\frac{1}{4}$	SCREW.	1	500	500
$\frac{3}{4}$	3 to 4	$14\frac{1}{2}$	4	2	$1\frac{1}{2}$	5	4	"	1	500	500
1	4 to 5	18	6	$2\frac{1}{4}$	$2\frac{1}{4}$	$6\frac{1}{2}$	$4\frac{1}{2}$	"	2	400	450
$1\frac{1}{4}$	5 to 6	19	6	$3\frac{1}{4}$	$2\frac{1}{2}$	$6\frac{3}{4}$	5	"	3	400	450
$1\frac{1}{2}$	6 to 7	25	$7\frac{1}{8}$	$3\frac{3}{4}$	3	8	6	"	$2\frac{1}{2}$	380	420
2	7 to 8	26	$7\frac{1}{2}$	$4\frac{1}{4}$	$3\frac{3}{8}$	8	7	"	$2\frac{1}{4}$	380	420
$2\frac{1}{4}$	8 to 10	30	9	5	4	9	$7\frac{1}{2}$	"	4	360	390
3	10 to 12	35	$10\frac{1}{2}$	$5\frac{1}{2}$	$4\frac{1}{2}$	11	9	"	5	300	320
$3\frac{1}{4}$	12 to 14	36	$10\frac{1}{2}$	6	$5\frac{1}{2}$	11	10	$7\frac{1}{2}$	5	300	320
4	14 to 16	42	12	$7\frac{1}{4}$	$6\frac{1}{2}$	12	11	9	6	300	320
$4\frac{1}{2}$	16 to 18	42	12	$7\frac{1}{4}$	$6\frac{1}{2}$	13	11	9	6	300	320
5	18 to 20	48	$12\frac{1}{2}$	8	$7\frac{1}{2}$	15	12	10	6	250	275
6	24 to 28	52	$12\frac{1}{2}$	$8\frac{1}{2}$	8	$16\frac{1}{2}$	13	11	7	250	275
7	28 to 32	54	$12\frac{1}{2}$	9	$8\frac{1}{2}$	$16\frac{1}{2}$	14	12	7	250	275
8	32 to 36	56	14	$9\frac{1}{2}$	$10\frac{1}{2}$	18	16	14	8	250	275
10	40 to 44	66	16	$10\frac{1}{2}$	14	20	18	16	10	225	250

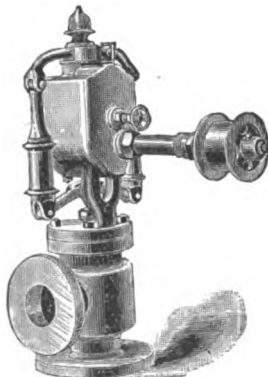


Fig. 372.

THE CRAIG GOVERNOR, FOR STEAM ENGINES.

No Springs or Balls in its Construction.
Perfectly Balanced and Self-lubricating.—Runs in Oil.

SIZES.

SIZE.	ENG. CYL.	SIZE.	ENG. CYL.
$1\frac{1}{2}$ inches.	5 to 6 inches.	4 inches.	16 to 18 inches.
$1\frac{1}{4}$ "	7 to 8 "	$4\frac{1}{2}$ "	18 to 20 "
2 "	9 to 10 "	5 "	20 to 24 "
$2\frac{1}{4}$ "	11 to 12 "	6 "	26 to 32 "
3 "	13 to 15 "	7 "	32 to 36 "
$3\frac{1}{2}$ "	15 to 16 "	8 "	36 to 42 "

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE JUDSON GOVERNOR,

WITH
AUTOMATIC STOP MOTION, SPEEDER, SAWYER'S LEVER, AND STOP
VALVE.

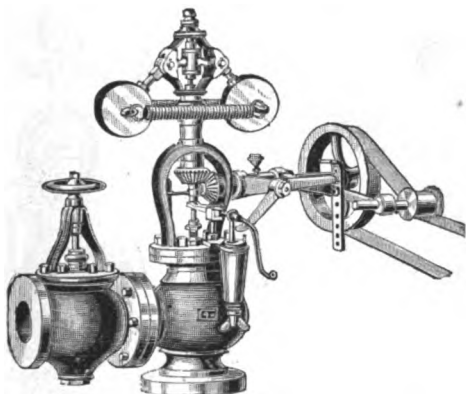


Fig. 373.

THESE GOVERNORS ARE NOW MADE IN TWO FORMS.

The Standard Governor (slow speeded,) } Prices the same.
The Spring Governor (high speeded,) }

The Standard Governor is too well known to require special description. The Spring form has been introduced to meet the wants of those desiring a durable High Speeded Governor.

IN ORDERING.—For convenience in ordering, the two kinds of Governors—Standard and Spring—are described in two classes, A and B—workmanship and quality the same. Class A (see figs 377 and 378), either Standard or Spring Governor, with Automatic Stop Motion, Spring Speeder and Sawyer's Lever. Class B (see figs. 375 and 376), either Standard or Spring Governor, with spring Speeder and Sawyer's Lever, but without the Automatic Stop Motion.

FIGS. 13 A, B, C, D AND E, REPRESENT THE VARIOUS STYLES OF (GOVERNOR) VALVE-CHAMBER.

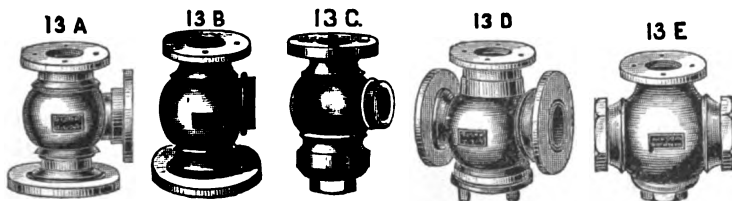


Fig. 374.

- 13 A Angle Chamber, base and side flanged from $2\frac{1}{4}$ to 12 inches.
- 13 B Angle Chamber, base flanged, side screwed from $\frac{1}{2}$ to $2\frac{1}{2}$ inches.
- 13 C Angle Chamber, base screwed, side screwed from $\frac{1}{2}$ to $2\frac{1}{2}$ inches.
- 13 D Horizontal Chamber, flanged from $2\frac{1}{2}$ to 12 inches.
- 13 E Horizontal Chamber, screwed from $\frac{1}{2}$ to 2 inches.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE JUDSON GOVERNOR.

STANDARD OR SPRING.

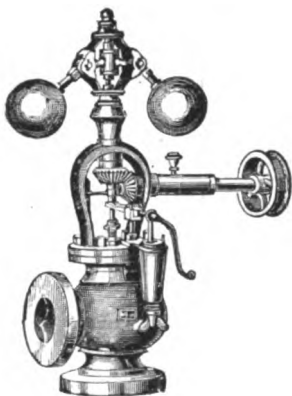


Fig. 375.
CLASS B, STANDARD.
(Slow Speeded).

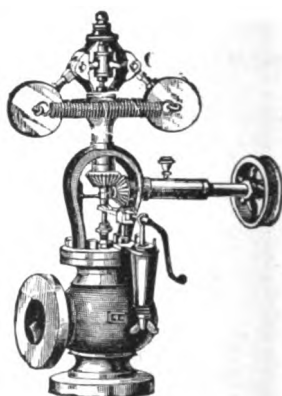


Fig. 376.
CLASS B, SPRING.
(Higher Speeded).

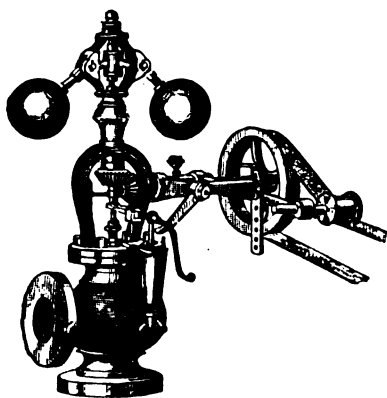


Fig. 377.
CLASS A, STANDARD.
(Slow Speeded).

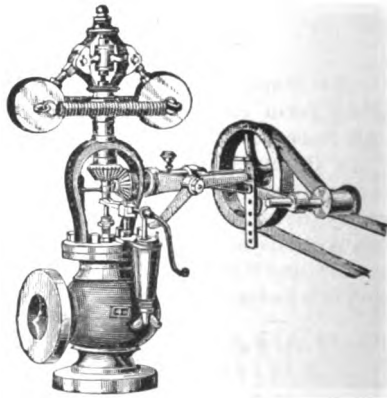


Fig. 378.
CLASS A, SPRING.
(Higher Speeded).

In ordering Governors, state which Class is wanted, whether Standard or Spring, Plain or Finished, and with or without Improved Globe or Angle Stop Valve.

N. B.—Governors are furnished with Sawyer's Lever only when ordered. All Governors are complete with Speeder, and Turned Flanged Pulley, without extra charge for the Speeder and Pulley.

In ordering, if we are informed of Speed of Engine and Diameter of Pulley on Engine Shaft from which Governor is driven, will put proper size of Pulley on Governor, otherwise the size of Pulley mentioned in table will be furnished with each Governor.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

THE JUDSON GOVERNOR.

TABLE OF DIMENSIONS.

SIZE OF GOVERNOR. DIAMETER OF OPENING.	1/4	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	7	8	9	10
Diameter Base Flange.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
Diameter Steam pipe Flange.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
From Center to Side Flange.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
From Base to Center of Inlet.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
Length Chambers 18 D and E.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
From Center to End of Shaft.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
Extreme Height.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
Greatest Swing of Balls.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
Revolutions Standard Gov.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
Revolutions Spring Gov.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
Pulley on Spring Gov.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
Pulley on Standard Gov.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2
Corresp'n Diam. of Eng. Cyl.	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2

REGISTER OR SAWYER'S VALVE.

The Valve is held against and adjusted to its seat by the set-screw A, having steel step in end against which the Valve Stem revolves, both Step and Stem being hardened. The Valve must be placed in the steam pipe so that the Valve-cover will be forced away from its seat by the steam, then adjust it up to its seat by the set-screw, so it will move freely without leaking. It is used extensively in Saw Mills, as a Sawyer's Valve; in Mines, and as a Relief Valve, for Hoisting Engines, etc.

SIZES :

Diam. of Pipe, inches... 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 5.
Diam. of Flange, " .. 5 1/2, 6, 7, 8, 9, 10, 11.
Length of Valve, " .. 7, 8 1/2, 9 1/2, 12, 13, 14, 16.

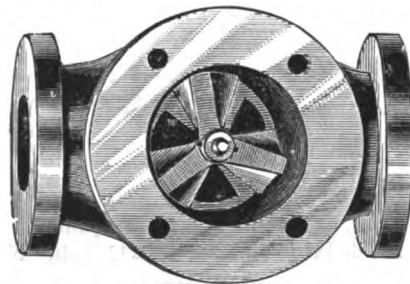


Fig. 380.

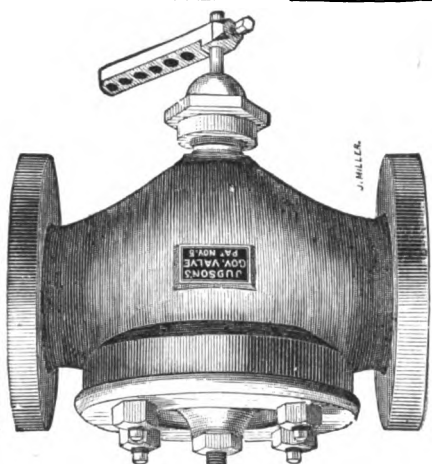


Fig. 379.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

MALLEABLE IRON STOCKS,

With Loose Handles and Solid Dies for Threading Iron Pipe.



Fig. 881.

Sectional view of Nos. 3, 4 and 5, stocks showing latest improvements.

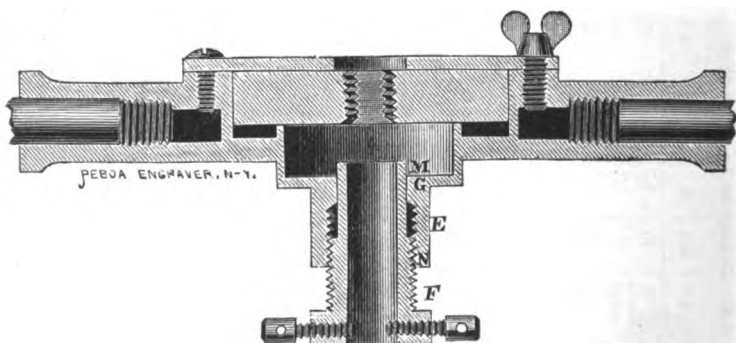


Fig. 882.

This improvement is to effectually prevent the chips and grit from getting between the feed screw F and its threaded socket E, by the close joint made at M G—thus obviating all trouble usually experienced with the leader or feed screw in this class of die stocks.

LIST OF SIZES.

Number	1, with regular outfit, cuts	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	inch pipe.
" 1 $\frac{1}{2}$,	"	"	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	"
" 2,	"	"	$\frac{3}{8}$	1		"
" 2 $\frac{1}{2}$,	"	"	$\frac{3}{8}$	1	1 $\frac{1}{2}$	"
" 2 $\frac{3}{4}$,	"	"	1	1 $\frac{1}{2}$	1 $\frac{3}{4}$	"
" 3,	"	"	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	"
" 4,	"	"	2 $\frac{1}{2}$	3		"
" 5,	"	"	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4

By using a "die holder" the following *extra sizes* may be used in our stocks.

Nos. 2 $\frac{1}{2}$ and 2 $\frac{3}{4}$ stocks will take $\frac{1}{2}$, $\frac{3}{4}$ and $\frac{1}{2}$ inch die.

No. 3 " " $\frac{3}{4}$ and 1 inch die.

No. 4 " " 1 $\frac{1}{2}$, 1 $\frac{3}{4}$ and 2 inch die.

SIZES OF DIES.

No. 1, 2x $\frac{1}{2}$ inch. No. 1 $\frac{1}{2}$, 2 $\frac{1}{2}$ x $\frac{3}{4}$ inch. No. 2 and 2 $\frac{1}{2}$, 3x $\frac{3}{4}$ inch. No. 2 $\frac{3}{4}$, 3x $\frac{3}{4}$ inch.
No. 3, 4x1 inch. No. 4, 5x1 $\frac{1}{2}$ inch. No. 5, 7 $\frac{1}{2}$ inch octagon x 1 $\frac{1}{2}$.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

COMBINATION SCREWING STOCKS

WITH LOOSE DIES.

No. C.

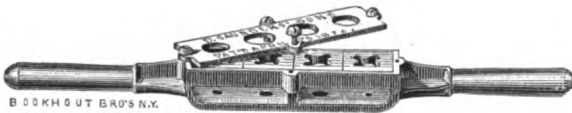


Fig. 883.

No. OO.

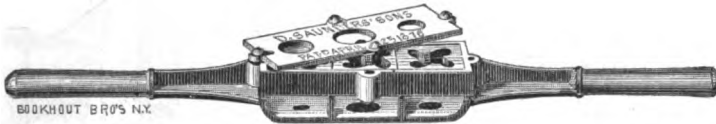


Fig. 884.

Number.....	0.	00.
Size Cut	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ in.	$\frac{1}{2}$, $\frac{3}{4}$, 1 in.

ARMSTRONG'S ADJUSTABLE STOCKS AND DIES, FOR PIPE AND BOLTS.

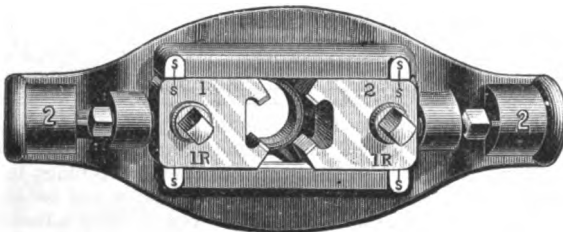


Fig. 885.

The Armstrong Dies being made in two parts instead of one (as in the solid Die) can be more perfectly constructed; the cutting edges reached more directly; the work done with greater precision and uniformity, by which they accomplish a much better result.

LIST OF SIZES.

Number.....	1	2	3
Sizes of Pipe Cut.....	$\frac{1}{2}$ to $\frac{1}{4}$	$\frac{1}{2}$ to 1	1 to 2 inches.
Sizes of Bolts.....	$\frac{1}{2}$ to $\frac{3}{4}$	$\frac{1}{2}$ to $1\frac{1}{2}$	

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HAND PIPE

TAPS

AND

REAMERS.

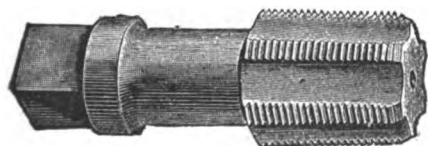


Fig. 387.

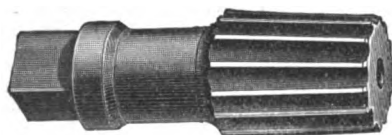


Fig. 388.

Sizes, $\frac{1}{8}$ to 3 inch.

SAUNDERS' HAND PIPE CUTTER.



Fig. 389.

Number	1	2	3
Sizes Cut	$\frac{1}{8}$ to 1	1 to 2	2 to 3 inch.

STANWOOD OR NATIONAL STEEL PIPE CUTTERS.



Fig. 390.

Number	1	2	3
Sizes Cut	$\frac{1}{8}$ to $\frac{3}{4}$	1 to 2	2 to 3 inch.

EUREKA PIPE CUTTER.



EXTRA PARTS.



Cutter Block with Wheel.



Extra Jaw.



Wheel.



Wheel Pin.

Fig. 391.

Number	1	2	3
Size Cut	$\frac{3}{4}$ to 1	$\frac{3}{4}$ to 2	1 to 3 inch.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

ALLIGATOR WRENCH

FOR GRIPPING ROUND IRON OR PIPE.



Fig. 892.

SIZES.

Number.....	1	2	3	4	5
Holds Pipe.....	$\frac{1}{2}$ to $\frac{3}{4}$,	$\frac{3}{4}$ to $1\frac{1}{2}$,	$1\frac{1}{2}$ to $2\frac{1}{2}$,	$2\frac{1}{2}$ to $3\frac{1}{2}$ inches.	
" Round Iron.....	$\frac{1}{2}$ to $\frac{3}{4}$,	$\frac{3}{4}$ to $1\frac{1}{2}$,	$1\frac{1}{2}$ to $2\frac{1}{2}$,	$2\frac{1}{2}$ to $3\frac{1}{2}$ "	
Length.....	5 $\frac{1}{2}$,	10,	16,	22,	27. "

SAUNDERS' WHEEL PIPE-CUTTER.



Fig. 893.

SIZES.

Number.....	1	2	3
Cuts Pipe.....	$\frac{1}{2}$ to 1,	1 to 2,	2 to 3 inches.

Crow for Drilling and Tapping Street Mains

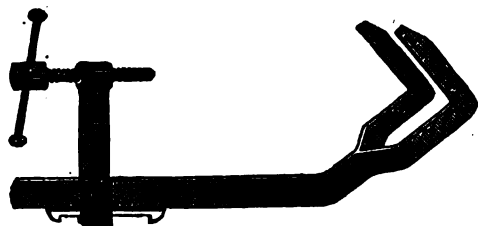


Fig. 894.

SIZES.

Number.....	1	2	3
For Pipe	$1\frac{1}{2}$ to 3,	$1\frac{1}{2}$ to 6,	$1\frac{1}{2}$ to 12 inches.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

GAS PLIERS, No. 45.

SOLID STEEL.

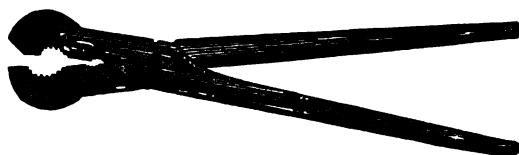


Fig. 895.

Polished	5	6	7	8	9	10	11	12	13	14	inch.
Half polished	7	8	9	10	11	12	13	14	inch.		
Extra heavy	15	16	inch,								

BURNER PLIERS, No. 451.

DOUBLE JOINTS.

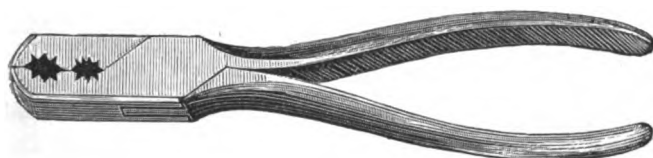


Fig. 896.

Size 5 6 7 inch.

BURNER PLIERS, No. 452.

BEST CAST STEEL.

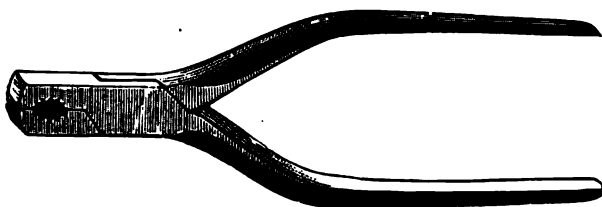


Fig. 897.

Size 4½ inch.

POCKET PLIERS, No. 450.

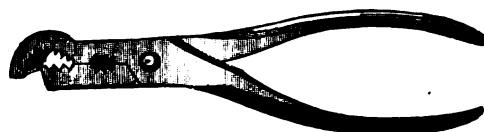


Fig. 898

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

ORDINARY PIPE TONGS.



Fig. 399.

Sizes..... $\frac{1}{4}$ to 3 inch.

BROWN'S ADJUSTABLE PIPE TONGS.

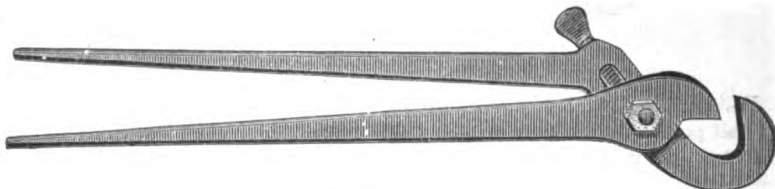


Fig. 400.

Number..... 1 $1\frac{1}{2}$ 2 3 4 5 6 7
 Sizes they will take... $\frac{1}{4}$ to $\frac{1}{2}$, $\frac{3}{8}$ to 1, $\frac{1}{2}$ to $1\frac{1}{2}$, 1 to 2, $1\frac{1}{2}$ to 3, $2\frac{1}{2}$ to 4, 3 to 5, 4 to 7 in.

ROBBIN'S CHAIN TONGS.



Fig. 401.

Number..... 2 3 4 5 6
 Length of Lever..... 27 in. 3 ft. 4 ft. 5 ft. 6 ft.
 Sizes they will take..... 1 to 2 $1\frac{1}{2}$ to 4 2 to 6 $2\frac{1}{2}$ to 8 4 to 10 in.

STILLSON'S PIPE WRENCH.

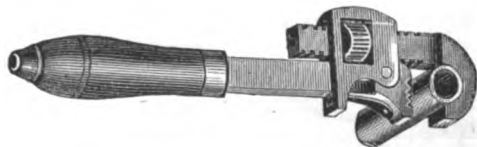


Fig. 402.

Length..... 6 8 10 14 18 24 36 48 in.
 Sizes they will take... $\frac{1}{4}$ to $\frac{1}{2}$, $\frac{1}{2}$ to $\frac{3}{4}$, $\frac{1}{2}$ to 1, $\frac{1}{2}$ to $1\frac{1}{2}$, $\frac{1}{2}$ to 2, $\frac{1}{2}$ to $2\frac{1}{2}$, $\frac{1}{2}$ to 3, 1 to 5 "

WEBSTER'S COMBINATION WRENCH AND CUTTER.

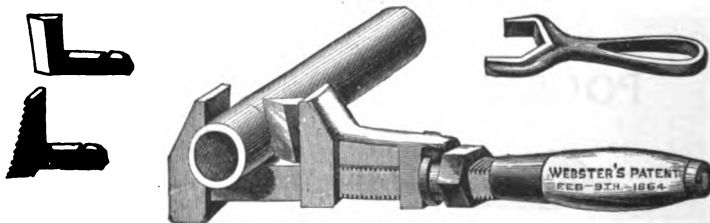


Fig. 403.

Length..... 12 15 18 21 inch.
 Sizes they will take..... $\frac{1}{4}$ to $\frac{1}{2}$ $\frac{1}{2}$ to $1\frac{1}{2}$ $\frac{1}{2}$ to 2 $\frac{1}{2}$ to $2\frac{1}{2}$ "

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FOR PRICES SEE ACCOMPANYING LIST.

JARECKI ADJUSTABLE PIPE TONGS.

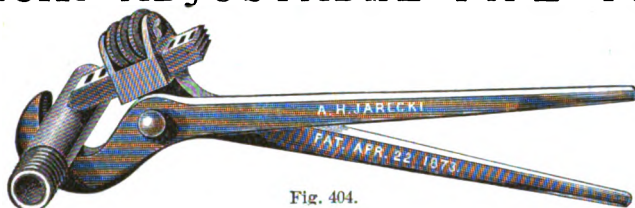


Fig. 404.

Number.....	0	1	2	3	4	5
Sizes held.....	$\frac{1}{4}$ to $\frac{3}{4}$	$\frac{1}{4}$ to 1	$\frac{1}{4}$ to 1 $\frac{1}{2}$	$\frac{1}{2}$ to 2 $\frac{1}{2}$	$\frac{3}{4}$ to 2 $\frac{1}{2}$	2 $\frac{1}{2}$ to 6 inches.

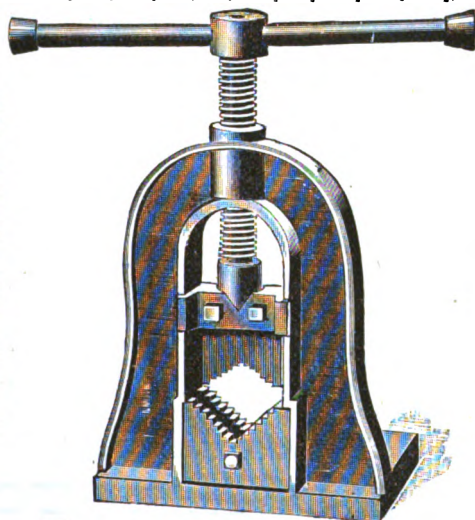


Fig. 405 1/2.

CUTS OF NOS. 1 AND 2 VISE.

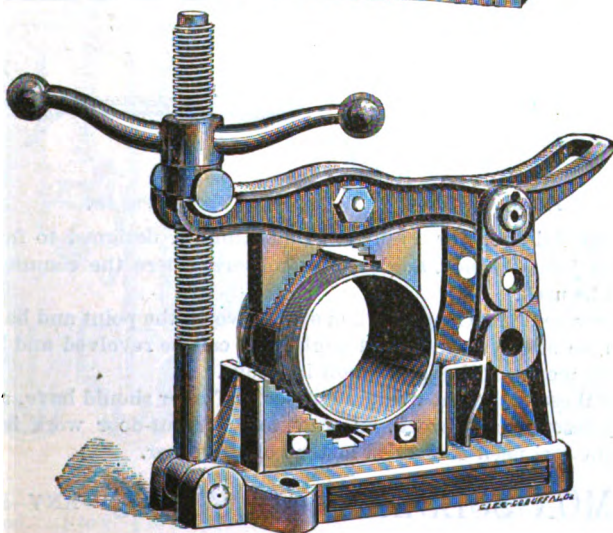


Fig. 405.

MALLEABLE IRON PIPE VISES.

CUT OF No. 3 VISE—2 to 6 inches.

SIZES.

Number.....	1	2	3
Sizes held.....	$\frac{1}{4}$ to 2	$\frac{1}{4}$ to 3	2 to 6 inches.

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FOR PRICES SEE ACCOMPANYING LIST.

THE "HANDY" Combination Bench and Pipe Vise.

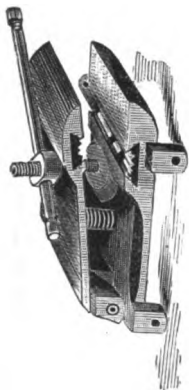


Fig. 406.

This most convenient little Vise is made entirely of Refined CAST STEEL, the jaws for pipe being finely tempered, and when worn down can be replaced with new ones in a few moments at a small expense.

The Vise will take pipe from $\frac{1}{4}$ to $1\frac{1}{4}$ and will hold firmly a shorter Nipple than any other pipe vise made.

It has also regular jaws, similar to the ordinary bench vise, and can be used as such in addition to holding pipe. It weighs but NINE POUNDS, can be easily carried in a tool-bag or kit, and can be screwed in a few moments to any bench, door-post, upright or any place where four screws can be firmly driven.

ALL PARTS ARE MADE INTERCHANGEABLE.

PLUMBERS' SOLDERING COPPER, PATENTED, SPECIAL TOOL.

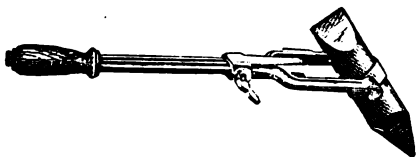


Fig. 407.

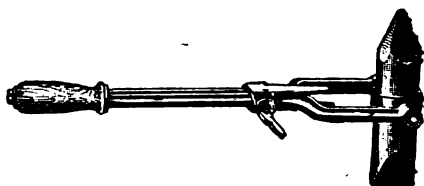


Fig. 408.

This is a special tool for Plumbers and Tinnerns, designed to facilitate the soldering of all joints, bends, angles, and corners, where the common ordinary Copper cannot be used.

The cuts represent the Coppers when set for work, the point and hatchet being down. It can be set to any desired angle, and can be revolved and held at any desired angle by means of the thumb-bolt in sleeve.

It is one of those tools that every Plumber or Tinner should have, as it can be used for every description of work, READILY, and for out-door work is indispensable, as only one tool need be carried instead of a number.

COMMON SOLDERING COPPERS—ANY SIZE.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PIPE VISES.

MALLEABLE IRON, No. 2.

MALLEABLE IRON, No. 1.

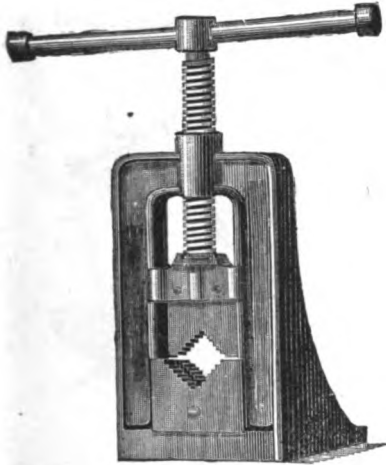


Fig. 409.

Sizes gripped, $\frac{1}{4}$ to 2 in. Weight, 15 lbs.
PIPE VISE, WITH ANGLE PLATE.

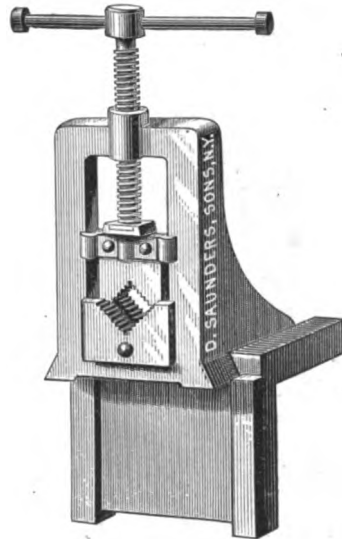


Fig. 410.

Sizes gripped, $\frac{1}{4}$ to 2 in. Weight, 30 lbs.

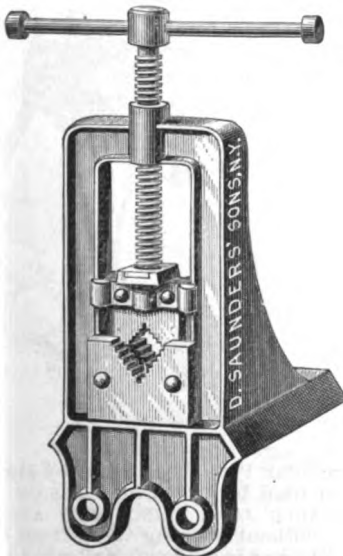


Fig. 411.

Number..... 1 2 3
Sizes gripped..... $\frac{1}{4}$ to 2 $\frac{1}{4}$ to 3 $\frac{1}{4}$ to 4 inches.

IMPROVED PIPE VISE, WITH STAND.

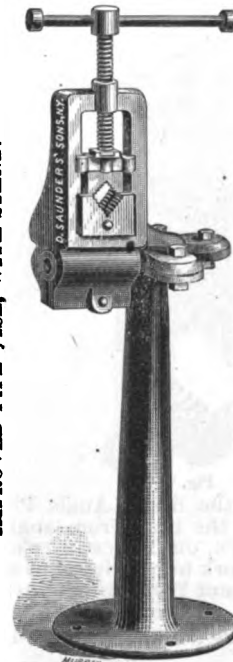


Fig. 412.

Number..... 1 2 3
Sizes gripped..... $\frac{1}{4}$ to 2, $\frac{1}{4}$ to 3 $\frac{1}{4}$ to 4 inches.
Either Vises or Stands will be furnished separate if desired.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PIPE VISES.

MALLEABLE IRON.

NASON'S PIPE VISE.

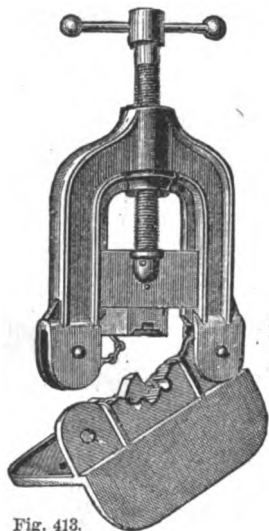


Fig. 413.

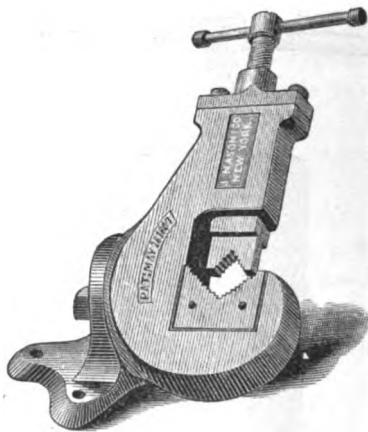


Fig. 414.

Number.....	1	2	Number.....	1	2	3
Sizes gripped.....	$\frac{1}{4}$ to 2	$\frac{1}{4}$ to 3 in.	Sizes gripped....	$\frac{1}{4}$ to 1 $\frac{1}{2}$	$\frac{1}{4}$ to 2	$\frac{1}{4}$ to 3 in.

PORTABLE PIPE VISE.

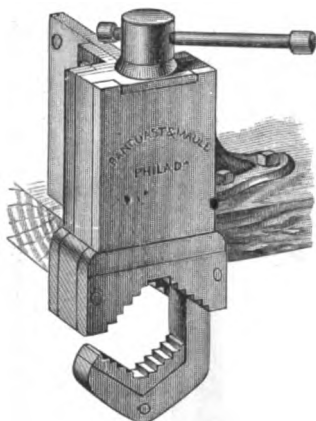


Fig. 415

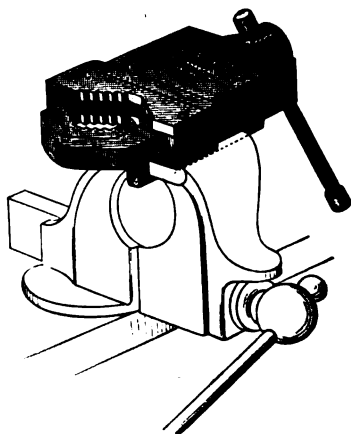


Fig. 416.

With the Bench Angle Plate it forms a regular Pipe Vise, while by simply detaching the head from angle plate it may be used between THE JAWS OF ANY MACHINIST'S OR BLACKSMITH'S VISE. The MOVABLE JAWS BEING OPEN AT SIDE permits work to be gripped at any desired point without slipping it in from end, and allows of FITTINGS BEING HELD securely. The box is made of Malleable Iron, the screw of Wrought Iron, and the remainder of Solid Steel throughout. The Steel Gripping Jaws can be duplicated and replaced at any time when worn out.

Sizes..... $\frac{1}{4}$ to 3 inches.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PARKER'S PATENT PIPERS' VISES.

WITH INTERCHANGEABLE JAWS.—No. 86.

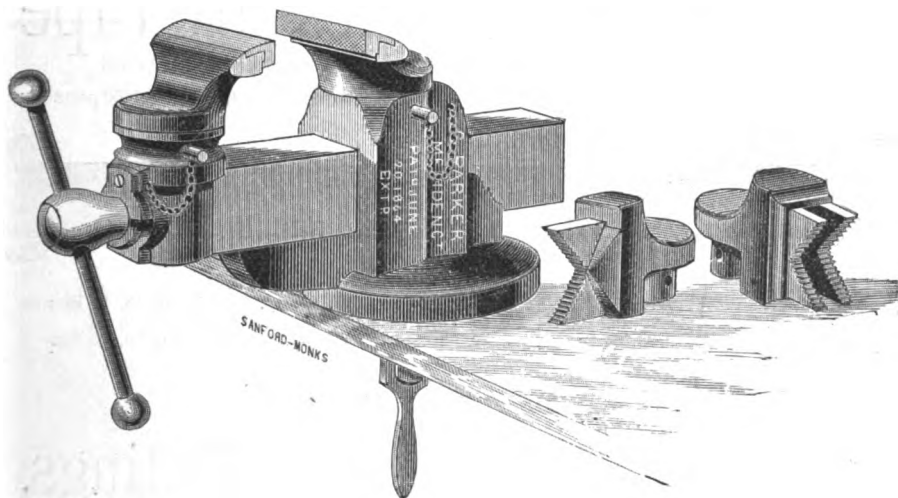


Fig. 417.

- No. 81. Round Jaws, both Jaws swivel, weight, 62 lbs. each.
 No. 82. Pipers' Jaws, " 64 " "
 No. 86. Round and Pipers' Jaws, " 79 " "
 For holding 3 inch pipe and under.
 No. 83. Round, Pipers' and Coach Makers' Jaws, Weight, 97 lbs. each.

PARKER'S PATENT COMBINATION PIPE VISES.—No. 87.

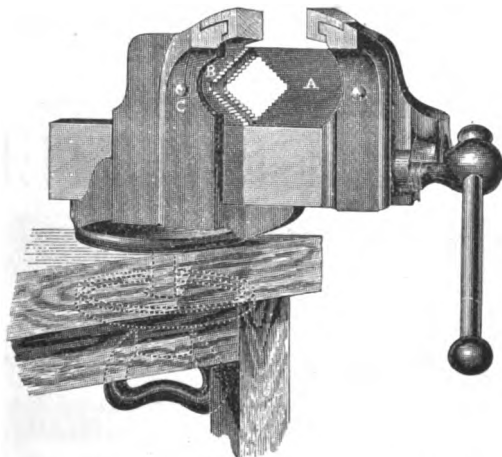


Fig. 418.

- No. 87. Round and Pipers' Jaws, weight, 43 lbs each. For holding 2 in. pipe and under.
 No. 88. " " " 63 " " 3 " "
 No. 88½. " " " 90 " " 4 " "
 No. 89. " " " 140 " " 6 " "

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HEAVY GALVANIZED WROUGHT IRON Spiral-Rivetted Pressure Pipe

FOR WATER, EXHAUST STEAM, BLOW-OFF, SUCTION AND AIR COMPRESSOR PIPES.

Manufactured in any desired Lengths, not exceeding 20 feet, each length tested to 150 pounds, Hydraulic Pressure.



Fig. 419.

Inside Diam. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20 inches.
 Thickness W. G. No. 18, 18, 18, 18, 16, 16, 16, 16, 14, 14, 14, 14, 12, 12, 12
 Weight per foot. 24, 4, 5, 6, 7, 8, 9, 12, 13, 14, 16, 18, 20, 24, 30, 35 lbs.

GALVANIZED

Cast and Wrought Iron Fittings.

FOR SPIRAL FLANGED PIPE.

TEE.



Fig. 420.

CROSS.

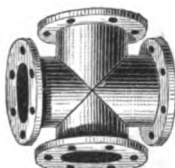


Fig. 421.

ELBOW.



Fig. 422.

REDUCER.



Fig. 423.

Sizes, 3 to 20 inches. Gaskets and Bolts extra.

SPIRAL SEAM RIVETTED PIPE

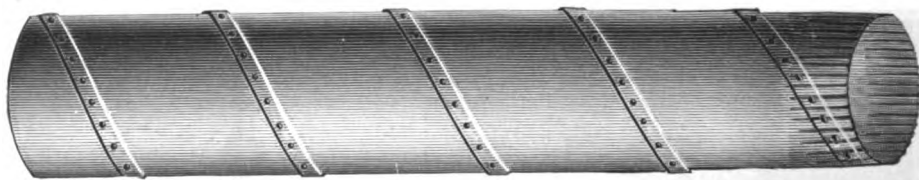


Fig. 424.

Diameter.	3	4	5	6	7	8	9	10	11	12	13	14 in.
WEIGHT PER 100 FEET.												
No. 24, W. G.	100,	130,	160,	185,	210,	240,	280,	300,	325,	400	lbs.	
" 22, "	140,	165,	200,	250,	290,	320,	340,	380,	420,	480,	530,	600 lbs.
" 20, "	150,	200,	250,	300,	325,	400,	450,	500,	550,	600,	650,	700 "
" 18, "	185,	245,	300,	360,	400,	460,	525,	575,	625,	750,	800,	900 "
" 16, "	—	—	—	500,	550,	650,	750,	800,	850,	1,050,	1,100,	1,200 "
" 14, "	—	—	—	—	—	850,	950,	1,050,	1,150,	1,350,	1,450,	1,550 "

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PUNCHED AND ROLLED SHEETS.

SINGLE SECTION.

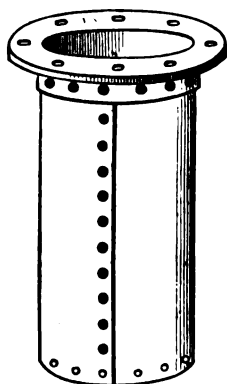


Fig. 425.

PACKED FOR SHIPMENT.

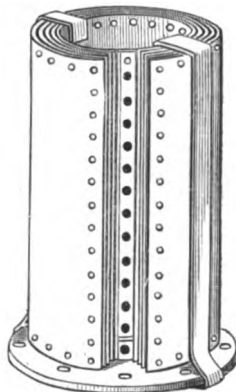


Fig. 426.

Any thickness and diameter, black, galvanized or dipped in coal tar.

PATENT ADJUSTABLE ELBOWS.

Fig. 427 shows the same elbow in three different positions.



Fig. 427.



STIFF ELBOWS.



Fig. 428.

Sizes..... 1½ to 10 inches.

Sizes... 1 to 12 in

CORRUGATED SHEET IRON.

BLACK AND GALVANIZED FOR ROOFING.

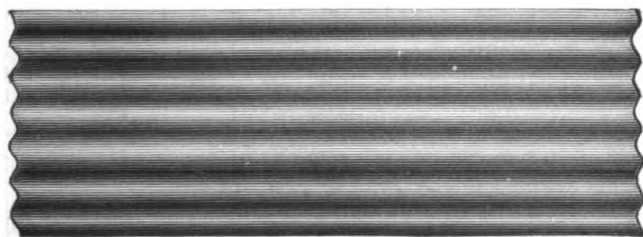


Fig. 429.

Usual size of Sheets
26½ x 84.

No. W. G.....	16	18	20	22	24	26
Weight per sq. foot.....	48	40	30	24	20	16 ounce.

All weights are approximate, not actual.

22 CORTLANDT STREET NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

CAST IRON PIPE,

For Water, Gas, Etc.

TABLE OF DIMENSIONS AND WEIGHTS.

Size—Inches.	Thickness in inches.	Weight, per foot—lbs.	Weight—per length—lbs.	Adapted to head of water—feet.	Size—Inches.	Thickness in inches.	Weight, per foot—lbs.	Weight, per length—lbs.	Adapted to head of water—feet.
1½.....	$\frac{1}{8}$	5	35	75	14.....	$1\frac{1}{8}$	108	1,341	125 to 175
1½.....	$\frac{1}{8}$	6½	49½	75 to 125	14.....	$1\frac{1}{8}$	127	1,577	175 to 235
1½.....	$\frac{1}{8}$	7½	52½	125 to 175	16.....	$1\frac{1}{8}$	101	1,254	75
1½.....	$\frac{1}{8}$	9	63	175 to 225	16.....	$1\frac{1}{8}$	117	1,453	75 to 125
2.....	$\frac{1}{8}$	6	42	75	16.....	$1\frac{1}{8}$	134	1,664	125 to 175
2.....	$\frac{1}{8}$	7½	52½	75 to 125	16.....	$1\frac{1}{8}$	155	1,925	175 to 225
2.....	$\frac{1}{8}$	9	63	125 to 175	18.....	$1\frac{1}{8}$	120	1,490	75
2.....	$\frac{1}{8}$	10½	73½	175 to 225	18.....	$1\frac{1}{8}$	132	1,639	75 to 125
3.....	$\frac{1}{8}$	11	138	75	18.....	$1\frac{1}{8}$	162	2,011	125 to 175
3.....	$\frac{1}{8}$	12½	154	75 to 125	18.....	$1\frac{1}{8}$	187	2,322	175 to 225
3.....	$\frac{1}{8}$	15	180	125 to 175	20.....	$1\frac{1}{8}$	140	1,738	75
3.....	$\frac{1}{8}$	17½	216	175 to 225	20.....	$1\frac{1}{8}$	154	1,912	75 to 125
4.....	$\frac{1}{8}$	16½	203	75	20.....	$1\frac{1}{8}$	194	2,409	125 to 175
4.....	$\frac{1}{8}$	18	222	75 to 125	20.....	1	221	2,744	175 to 225
4.....	$\frac{1}{8}$	19½	240	125 to 175	24.....	$1\frac{1}{8}$	200	2,488	75
4.....	$\frac{1}{8}$	21	259	175 to 225	24.....	$1\frac{1}{8}$	208	2,583	75 to 125
6.....	$\frac{1}{8}$	25	309	75	24.....	1	266	3,303	125 to 175
6.....	$\frac{1}{8}$	30½	376	75 to 125	24.....	$1\frac{1}{8}$	306	3,800	175 to 225
6.....	$\frac{1}{8}$	32½	400	125 to 175	30.....	$1\frac{1}{8}$	262	3,275	75
6.....	$\frac{1}{8}$	35	432	175 to 225	30.....	$1\frac{1}{8}$	303	3,787	75 to 125
8.....	$\frac{1}{8}$	40½	499	75	30.....	$1\frac{1}{8}$	374	4,675	125 to 175
8.....	$\frac{1}{8}$	43	530	75 to 125	30.....	$1\frac{1}{8}$	455	5,687	175 to 225
8.....	$\frac{1}{8}$	48½	598	125 to 175	36.....	$1\frac{1}{8}$	350	4,375	75
8.....	$\frac{1}{8}$	54	666	175 to 225	36.....	$1\frac{1}{8}$	413	5,162	75 to 125
10.....	$\frac{1}{8}$	53	654	75	36.....	$1\frac{1}{8}$	522	6,525	125 to 175
10.....	$\frac{1}{8}$	57	703	75 to 125	36.....	$1\frac{1}{8}$	633	7,913	175 to 225
10.....	$\frac{1}{8}$	67	826	125 to 175	40.....	$1\frac{1}{8}$	419	5,288	75
10.....	$\frac{1}{8}$	73	900	175 to 225	40.....	$1\frac{1}{8}$	489	6,115	75 to 125
12.....	$\frac{1}{8}$	68	839	75	40.....	$1\frac{1}{8}$	637	7,963	125 to 175
12.....	$\frac{1}{8}$	72	888	75 to 125	40.....	$1\frac{1}{8}$	772	9,650	175 to 225
12.....	$\frac{1}{8}$	84	1,086	125 to 175	48.....	$1\frac{1}{8}$	567	7,088	75
12.....	$\frac{1}{8}$	97	1,196	175 to 225	48.....	$1\frac{1}{8}$	667	8,388	75 to 125
14.....	$\frac{1}{8}$	84	1,043	75	48.....	$1\frac{1}{8}$	864	10,800	125 to 175
14.....	$\frac{1}{8}$	94	1,167	75 to 125	48.....	2	1,058	13,225	175 to 225

All Pipes are tested to 300 lbs. per square inch.

Other weights adapted to any head or pressure.

All Pipes cast vertically in dry sand, in lengths of 12 feet, exclusive of the bell, except 1½ inch and 2 inch.

Lead Pipe, Copper and Brass Tubing.

PRICES FURNISHED ON APPLICATION.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

NORWAY IRON RIVETS.

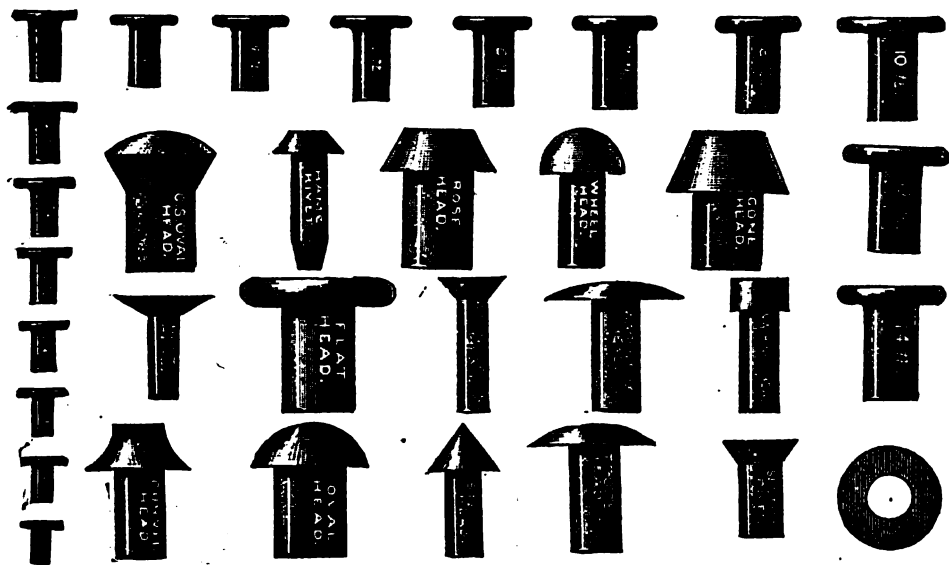


Fig. 430.

IRON WOOD SCREWS.

(SEE PRICE LIST.)

Cut Nails and Spikes.

Galvanized Nails and Boat Spikes.

TINNED AND SWEDES IRON TACKS, &C., AT LOWEST MARKET PRICES.

BAR IRON, ANGLES, TEES, CHANNELS, BEAMS, &C.

Plate Iron for Boilers, Tanks, Etc., Machinery and Tool Steel, at Market Rates.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Boiler, Bridge and Tank Rivets

AT LOWEST MARKET PRICES.

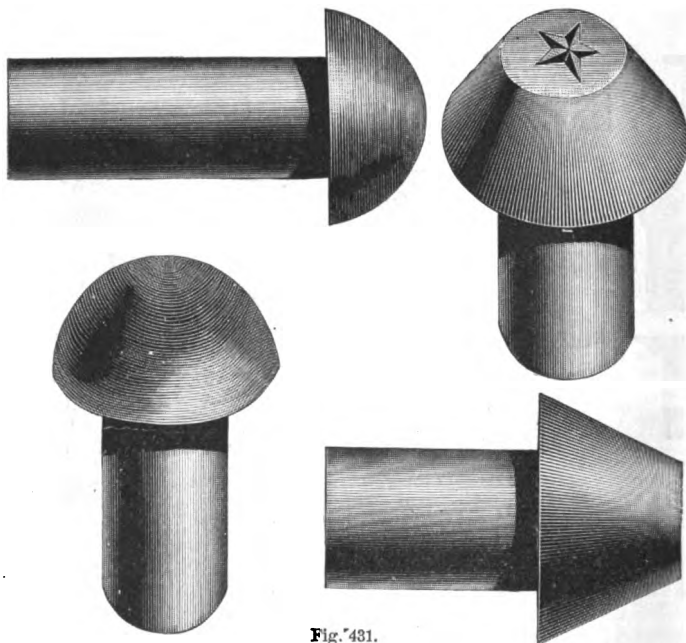


Fig. 431.

BOILER BRACE JAWS.

Machine Made, of square or round Iron..... $\frac{1}{4}$ to 1 inch diameter,
Quality of Iron Guaranteed.

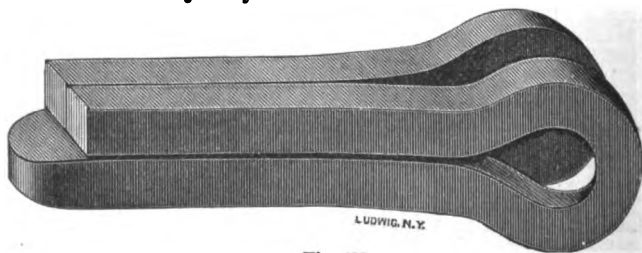


Fig. 432.

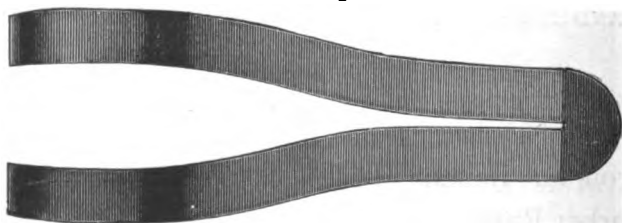


Fig. 433.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

MACHINE BOLTS.

With Square Heads and Nuts. Finished Points.

ROUND HEAD, SQUARE
NECK.

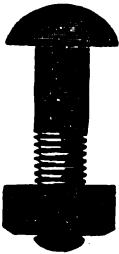


Fig. 434.

SQUARE.

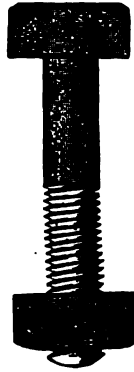


Fig. 435.

HEXAGON.



Fig. 436.

RAILROAD TRACK BOLTS.

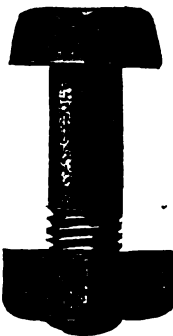


Fig. 437.



Fig. 438.



Fig. 439.

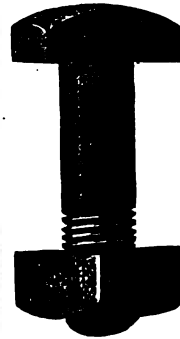


Fig. 440.

Made of any form or style of head required. All bolts pointed.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

**WOOD OR LAG SCREWS,
WITH SQUARE HEADS.**

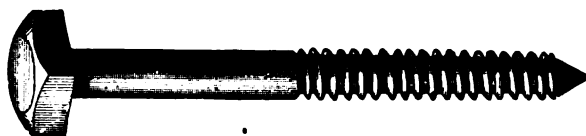


Fig. 441.

RATCHET THREAD TO DRIVE.



Fig. 442.

HANGER BOLTS.



Fig. 443.

**BOLT ENDS,
WITH SQUARE NUTS.**



Fig. 444.

TURN BUCKLES.

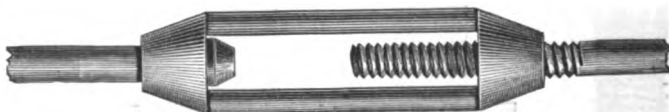


Fig. 445.



Fig. 446.

Larger sizes made to order. Please observe in ordering that these Turn Buckles are made right and left hand threads. The sizes given are diameters at bottom of threads, thus making the Buckle equal in strength to the rod for which it is intended. Swivel Turn Buckles like Fig. 445 above made only to order.

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CARRIAGE BOLTS.



Fig. 447.

MADE FROM CHARCOAL IRON, WITH FORGED NUTS AND OVAL HEADS.

TIRE BOLTS.

MADE FROM CHARCOAL IRON, WITH FORGED NUTS.



Fig. 448.

STOVE BOLTS.



Fig. 449.

ELEVATOR BOLTS.

FOR BOLTING BUCKETS TO GRAIN ELEVATORS.

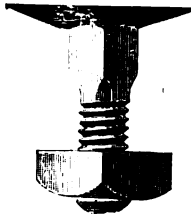


Fig. 450.

HOT PRESSED NUTS.

SQUARE

and

HEXAGON.

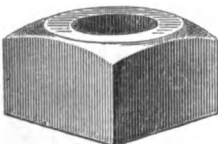


Fig. 451.

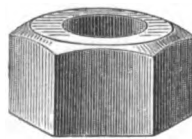


Fig. 452.

In kegs of 100 and 200 lbs.

CASE HARDENED FINISHED NUTS.—SEE PRICE LIST.

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WASHERS.



Fig. 453.

In kegs of 150 pounds each.

HARDENED STEEL SET SCREWS.

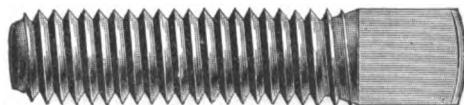


Fig. 454.

CASE HARDENED IRON SET SCREWS.

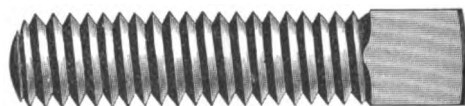


Fig. 455.

ROUND HEAD CAP SCREWS.

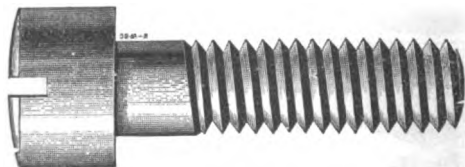


Fig. 456.

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STUDS.

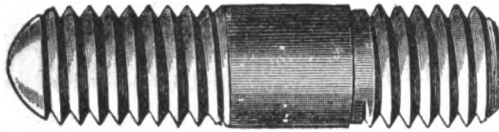


Fig. 457.

IRON AND BRASS MACHINE SCREWS.



Fig. 458.



Fig. 459.

MACHINISTS' HAND TAPS.

TAPER.

PLUG.

EOTTOMING.



Fig. 460.



Fig. 461.



Fig. 462.

TRAPS FOR MACHINE SCREWS.



Fig. 463.

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Blacksmiths' Taper Taps.

MACHINE
OR
NUT TAPS.



Fig. 463.



Fig. 464.

SCREW PLATES.

No. 1. Set complete, with 6 pairs of dies, $\frac{1}{8}$ " to $\frac{1}{4}$ ", taps and tap wrench in morocco case.



Fig. 465.

Morse Screw-Plates and Dies.

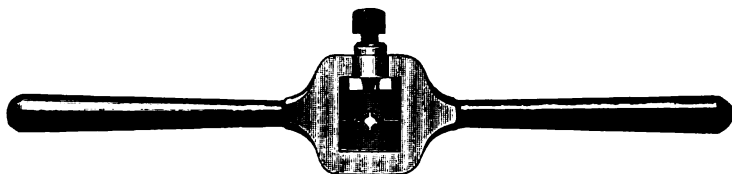


Fig. 466.

Size A, with 3 pair Dies, cutting $\frac{1}{4}''$, $\frac{3}{8}''$, $\frac{1}{2}''$.
 Size B, with 4 pair Dies, cutting $\frac{3}{8}''$, $\frac{1}{2}''$, $\frac{5}{8}''$, $\frac{3}{4}''$.
 Size C, with 4 pair Dies, cutting $\frac{1}{2}''$, $\frac{5}{8}''$, $\frac{3}{4}''$, $\frac{7}{8}''$.
 Size D, with 4 pair Dies, cutting $\frac{7}{8}''$, $1''$, $1\frac{1}{8}''$, $1\frac{1}{4}''$.
 Size E, with 6 pair Dies, cutting $1\frac{1}{8}''$, $1\frac{1}{2}''$, $1\frac{3}{4}''$, $1\frac{7}{8}''$, $2\frac{1}{8}''$, $2\frac{1}{2}''$.

Screw-Plates can have the following sizes of Dies :

Size A, $\frac{1}{4}$ to $\frac{3}{8}$.
 Size B, $\frac{1}{4}$ to $\frac{7}{8}$.
 Size C, $\frac{3}{8}$ to 1.

Size D, $\frac{1}{4}$ to $1\frac{1}{4}$.
 Size E, $1\frac{3}{4}$ to 2.

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B. & S. SCREW PLATES AND DIES.

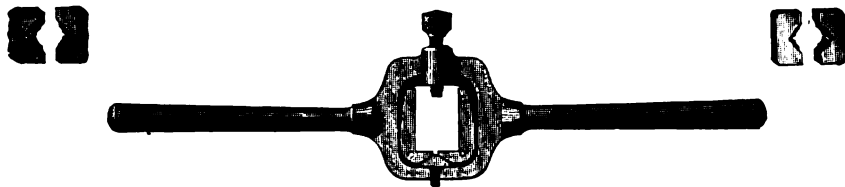


Fig. 467.

The Die Stock herewith represented is made in four sizes, for blacksmiths, tool, gun and model makers' use. It is drop-forged in one piece. The No. 0 is forged from a good quality of bar steel, and Nos. 1, 2 and 3 are forged from a good quality of bar iron. The Dies are made of the *best tool steel*, and both Stock and Dies are first-class goods in every respect.

Unless otherwise ordered, Dies will be furnished as follows

No. 1, with 5 pair Dies, $\frac{3}{16}$ ³², $\frac{1}{4}$ ²⁰, $\frac{5}{16}$ ¹⁸, $\frac{3}{8}$ ¹⁶, $\frac{7}{8}$ ¹⁴ in. diameter.

No. 2, with 5 pair Dies, $\frac{1}{2}$ ¹², $\frac{5}{8}$ ¹², $\frac{3}{4}$ ¹¹, $1\frac{1}{4}$ ¹¹, $\frac{3}{4}$ ¹⁰ in. diameter.

No. 3, with 5 pair Dies, $1\frac{3}{8}$ ¹⁰, $\frac{3}{4}$ ⁹, $1\frac{5}{8}$ ⁹, $1\frac{3}{4}$ ⁸, $1\frac{1}{2}$ ⁷ in diameter.

No. 1 Plate will take Dies from $\frac{3}{16}$ to $\frac{1}{4}$ in. inclusive.

No. 2 Plate will take Dies from $\frac{1}{2}$ to 1 in. inclusive.

No. 3 Plate will take Dies from $\frac{1}{2}$ to $1\frac{1}{4}$ in. inclusive.

LIGHTNING SCREW PLATES. In Cases.

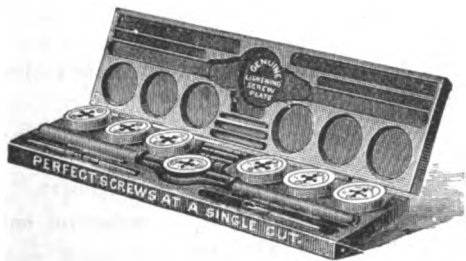


Fig. 468.

Assortment O cuts $\frac{1}{8}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{8}$, $\frac{1}{2}$ in. Stock 6 in. long.

Assortment A cuts $\frac{5}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ in. Stock 10 in. long.

Assortment AA cuts $\frac{5}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $\frac{1}{2}$ in. Stock 18 in. long.

Assortment B cuts $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$ in. Stock 28 in. long.

Assortment C cuts $\frac{3}{8}$, $\frac{5}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$ in. Stock 26 in. long.

Assortment D cuts $\frac{1}{2}$, 1, $1\frac{1}{2}$, $1\frac{3}{4}$, $1\frac{1}{2}$ in. Stock 53 in. long.

With each Stock is furnished Dies, Collets and Taper Taps. With No. O set a Tap Wrench also is furnished.

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Explanation of Die used in the Lightning Plates.

A, Die. B, Collet. D, Taper Screws regulating the Cut. E, Binding Screws. F, Guide for Bolts. Another binding screw, not shown in cut, opposite screw E on other side.

In adjusting the die, the binding screws, E, are first slackened, and the size required fixed by moving the taper-headed screws, D D, in or out: after which the binding screws, E, are set very tight the last thing.

PATENT
ADJUSTABLE
Tap Wrench.

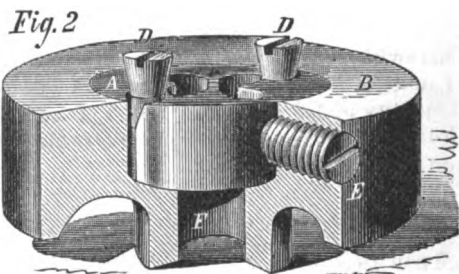


Fig. 469.

PATENT ADJUSTABLE TAP WRENCH.

No. 0 Wrench, fitting Taps from $\frac{1}{8}$ to $\frac{1}{4}$, inclusive, entire length, $5\frac{1}{2}$ inches.

- | | | |
|---|---|---|
| A | { | Fitting Taps from $\frac{1}{4}$ to $\frac{3}{8}$, inclusive; entire length 13 inches. |
| | | " Reamers from $\frac{1}{4}$ to $\frac{1}{2}$, inclusive. |
| B | { | Fitting Taps from $\frac{1}{4}$ to 1, inclusive; entire length 18 inches. |
| | | " Reamers from $\frac{3}{8}$ to 1, inclusive. |
| C | { | Fitting Taps from $\frac{7}{8}$ to $1\frac{1}{2}$, inclusive; entire length 23 inches. |
| | | " Reamers from $1\frac{1}{8}$ to $1\frac{1}{2}$, inclusive. |
| D | { | Fitting Taps from $1\frac{1}{2}$ to $2\frac{1}{8}$, inclusive; entire length $47\frac{1}{2}$ inches. |
| | | " Reamers from $1\frac{1}{8}$ to $2\frac{1}{8}$, inclusive. |

Fig. 470 is pattern of No. 0.

Fig. 471 is pattern of Nos. A to D.

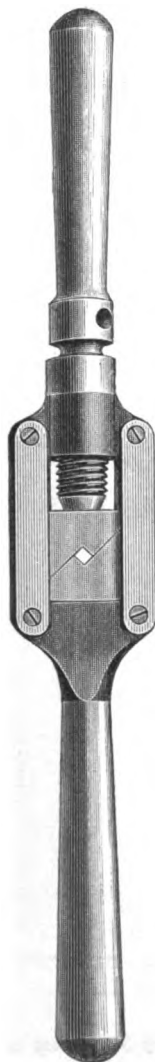


Fig. 470.

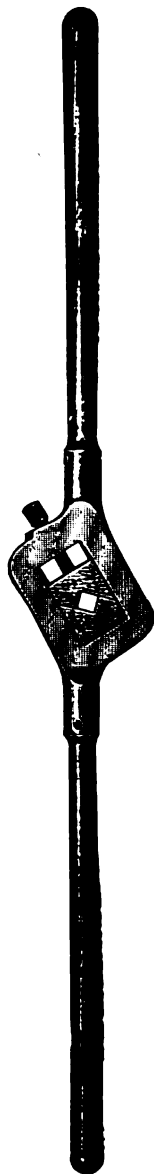


Fig. 471.

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BLACKSMITHS' STOCKS AND DIES.

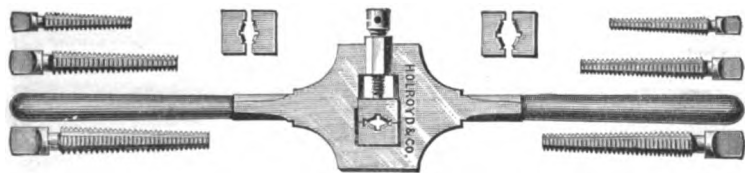


Fig. 472.

- No. 1. Cuts 2 in. to 1 in. Right Hand, $4\frac{1}{2}$ and 7 Threads to the inch.
 " 2 " 1 " Left " $4\frac{1}{2}$ and 7 " "
 8 Taps and 4 pair of Dies.
- No. 2. Cuts 2 in. to $\frac{1}{2}$ in. Right Hand, $4\frac{1}{2}$, 6, 7 and 8 Threads to the inch.
 8 Taps and 4 pair of Dies.
- No. 3. Cuts $1\frac{1}{2}$ in. to $\frac{1}{2}$ in. Right Hand, 6 and 8 Threads to the inch.
 " $1\frac{1}{2}$ " $\frac{1}{2}$ " Left " 6 and 8 " "
 8 Taps and 4 pair of Dies.
- No. 4. Cuts $1\frac{1}{2}$ in. to $\frac{1}{4}$ in. Right Hand, 6, 7, 8 and 9 Threads to the inch.
 8 Taps and 4 pair of Dies.
- No. 5. Cuts $1\frac{1}{2}$ in. to $\frac{1}{8}$ in. Right Hand, 8 and 9 Threads to the inch.
 " $1\frac{1}{2}$ " $\frac{1}{8}$ " Left " 8 and 9 " "
 8 Taps and 4 pair of Dies.
- No. 5 $\frac{1}{2}$. Cuts $1\frac{1}{2}$ in. to $\frac{1}{4}$ in. Right Hand, 6, 7, 8 and 9 Threads to the inch.
 8 Taps and 4 pair of Dies.
- No. 7. Cuts $1\frac{1}{2}$ in. to $\frac{1}{8}$ in. Right Hand, 8 and 10 Threads to the Inch.
 " $1\frac{1}{2}$ " $\frac{1}{8}$ " Left " 8 " "
 6 Taps and 3 pair of Dies.
- No. 9. Cuts $1\frac{1}{2}$ in. to $\frac{1}{2}$ in. Right Hand, 8, 10 and 12 Threads to the inch.
 6 Taps and 3 pair of Dies.
- No. 17. Cuts 1 in. to $\frac{1}{2}$ in. Right Hand, 9 and 12 Threads to the inch.
 " 1 " $\frac{1}{2}$ " Left " 9 " "
 6 Taps and 3 pair of Dies.
- No. 19. Cuts 1 in. to $\frac{3}{8}$ in. Right Hand, 9, 12 and 14 Threads to the inch.
 6 Taps and 3 pair of Dies.
- No. 25. Cuts $\frac{1}{2}$ in. to $\frac{3}{8}$ in. Right Hand, 10 and 12 Threads to the inch.
 " $\frac{1}{2}$ " $\frac{3}{8}$ " Left " 10 " "
 6 Taps and 3 pair of Dies.
- No. 27. Cuts $\frac{1}{2}$ to $\frac{3}{8}$ in. Right Hand, 10, 12 and 16 Threads to the inch.
 6 Taps and 3 pair of Dies.
- No. 45. Cuts $\frac{1}{2}$ in. to $\frac{1}{16}$ in. Right Hand, 12 and 16 Threads to the inch.
 " $\frac{1}{2}$ " $\frac{1}{16}$ " Left " 12 " "
 6 Taps and 3 pair of Dies.
- No. 47. Cuts $\frac{1}{2}$ in. to $\frac{1}{4}$ in. Right Hand, 12, 14 and 18 Threads to the inch.
 6 taps and 3 pair of Dies.
- No. 49. Cuts $\frac{1}{2}$ in. to $\frac{1}{4}$ in. Right Hand, 14 and 18 Threads to the inch.
 " $\frac{1}{2}$ " $\frac{1}{4}$ " Left " 14 " "
 6 Taps and 3 pair of Dies.
- No. 51. Cuts $\frac{1}{2}$ in. to $\frac{1}{16}$ in. Right Hand, 14 18 and 22 Threads to the inch.
 6 Taps and 3 pair of Dies.

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BLACKSMITHS' STOCKS AND DIES.

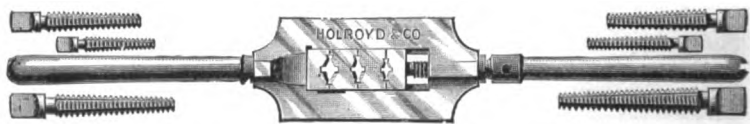


Fig. 478.

- No. 6. Cuts $1\frac{1}{2}$ in. to 1 in. Right Hand, 8 Threads to the inch.
 " $1\frac{1}{2}$ " 1 " Left " 8 " "
 4 Taps and 2 Sets of Dies.
- No. 11. Cuts $1\frac{1}{2}$ in. to $\frac{3}{4}$ in. Right Hand, 8 and 10 Threads to the inch.
 " $1\frac{1}{2}$ " $\frac{3}{4}$ " Left " 8 " "
 4 Taps and 3 Sets of Dies.
- No. 15. Cuts $1\frac{1}{2}$ in. to $\frac{1}{2}$ in. Right Hand, 8, 10 and 12 Threads to the inch.
 5 Taps and 3 Sets of Dies.
- No. 21. Cuts 1 in. to $\frac{1}{2}$ in. Right Hand, 9 and 12 Threads to the inch.
 " 1 " $\frac{1}{2}$ " Left " 9 " "
 4 Taps and 3 Sets of Dies.
- No. 23. Cuts 1 in. to $\frac{3}{8}$ in. Right Hand, 9, 10 and 14 Threads to the inch.
 3 Taps and 3 Sets of Dies.
- No. 32. Cuts $\frac{3}{4}$ in. to $\frac{3}{8}$ in. Right Hand, 10 and 14 Threads to the inch.
 " $\frac{3}{4}$ " $\frac{3}{8}$ " Left " " " " " "
 4 Taps and 4 Sets of Dies.
- No. 33. Cuts $\frac{3}{4}$ in. to $\frac{1}{2}$ in. Right Hand, 10 Threads to the inch.
 " $\frac{3}{4}$ " $\frac{1}{2}$ " Left " 10 " "
 2 Taps and 2 Sets of Dies.
- No. 34. Cuts $\frac{3}{4}$ in. to $\frac{1}{8}$ in. Right Hand, 10, 12 and 16 Threads to the inch.
 3 Taps and 3 Sets of Dies.
- No. 35. Cuts $\frac{3}{4}$ in. to $\frac{3}{8}$ in. Right Hand, 10 and 14 Threads to the inch.
 2 Taps and 2 Sets of Dies.
- No. 37. Cuts $\frac{3}{4}$ in. to $\frac{1}{8}$ in. Right Hand, 14, 18 and 22 Threads to the inch.
 6 Taps and 3 Sets of Dies.
- No. 38. Cuts $\frac{3}{4}$ in. to $\frac{1}{8}$ in. Right Hand, 12 and 18 Threads to the inch.
 " $\frac{3}{4}$ " $\frac{1}{8}$ " Left " 12 " "
 6 Taps and 3 Sets of Dies.
- No. 41. Cuts $\frac{1}{2}$ in. to $\frac{1}{4}$ in. Right Hand, 16, 20 and 26 Threads to the inch.
 6 Taps and 3 Sets of Dies.
- No. 42. Cuts $\frac{1}{2}$ in. to $\frac{1}{8}$ in. Right Hand, 14 and 20 Threads to the inch.
 " $\frac{1}{2}$ " $\frac{1}{8}$ " Left " 14 " "
 6 Taps and 3 Sets of Dies.
- No. 53. Cuts $\frac{1}{8}$ in. to $\frac{1}{16}$ in. Right Hand, 16, 20, 24 and 32 Threads to the inch.
 4 Taps and 4 Sets of Dies.

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MACHINISTS' STOCKS AND DIES.

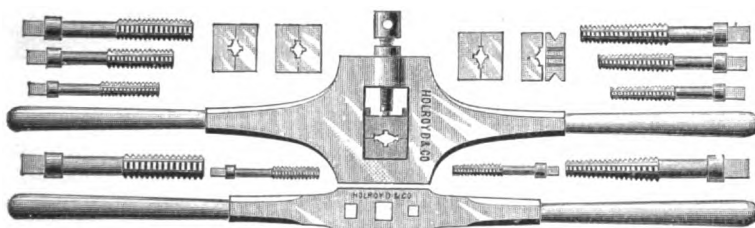


Fig. 474.

K. No. 1.	CUTS 2 IN. TO 1½ INCLUSIVE, RIGHT HAND.									
	Size,..... 2 in. 1½ in. 1½ in. 1½ in. 1½ in. & 1½ in. Plug and Taper Taps.									
	No. Th'ds,	4½	5	6	6	7	7 or 8	to the inch.		
	12 Taps, 6 pair of Dies and 2 Tap Wrenches.									

K. No. 2.	CUTS 1½ IN. TO ½ IN. INCLUSIVE, RIGHT HAND.									
	Size,.....1½ in. 1½ in. 1½ in. 1½ in. 1 in. & ½ in. Plug and Taper Taps.									
	No. Th'ds,	6	6	7	7 or 8	8	9	to the inch.		
	12 Taps, 6 pair of Dies and Wrench.									

K. No. 3.	CUTS 1½ IN. TO ½ IN. INCLUSIVE, RIGHT HAND.						
	Size,.... 1½ in. 1½ in. 1 in. ¾ in. & ½ in. Plug and Taper Taps.						
	No. Th'ds,	7	7 or 8	8	9	10	to the inch.
	10 Taps, 5 pair of Dies and Wrench.						

K. No. 4.	CUTS 1 IN. TO $\frac{1}{2}$ IN. INCLUSIVE, RIGHT HAND.						
	Size,..... 1 in. $\frac{1}{2}$ in. $\frac{1}{2}$ in. $\frac{1}{2}$ in. & $\frac{1}{2}$ in. Plug and Taper Taps.						
	No. Th'ds,	8	9	10	11	12 or 13	to the inch.
	10 Taps, 5 pair of Dies and Wrench.						

K. No. 5.	CUTS $\frac{1}{2}$ IN. TO $\frac{1}{2}$ IN. INCLUSIVE, RIGHT HAND.						
	Size, $\frac{1}{2}$ in. $\frac{1}{2}$ in. $\frac{1}{2}$ in. $\frac{1}{2}$ in. & $\frac{1}{2}$ in. Plug and Taper Taps.						
	No. Th'ds,	10	11	12 or 13	16	20	to the inch.
	10 Taps, 5 pair of Dies and Tap Wrench.						

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FOR PRICES SEE ACCOMPANYING LIST.

TWIST DRILLS.

STRAIGHT SHANK.



Fig. 475.

TAPER SHANK.



Fig. 476.

SHANK TO FIT BLACKSMITH DRILLS. (See pages 156-159.)



Fig. 477.

BIT STOCK SHANK.



Fig. 478.

STRAIGHT SHANK MACHINE BIT, for Wood.



Fig. 479.

SOCKETS FOR TAPER SHANK DRILLS.



Fig. 480.

If desired, Drills will be furnished in sets, as follows:

- No. 1.—Set of Taper Shank Drills, $\frac{1}{8}$ to 1 inch, varying by 16ths.
- No. 2.—Set of Taper Shank Drills, $\frac{3}{8}$ to $1\frac{1}{2}$ inch, varying by 16ths.
- No. 3.—Set of Taper Shank Drills, $\frac{3}{8}$ to $\frac{1}{2}$ inch, by 32ds, $\frac{1}{2}$ to $1\frac{1}{2}$ inch by 16ths.
- No. 4.—Set of Taper Shank Drills, $\frac{3}{8}$ to $\frac{1}{2}$ inch by 32ds, $\frac{1}{2}$ to 2 inch by 16ths.
- No. 5.—Set Drills, straight shanks, $\frac{1}{8}$ to $\frac{1}{2}$ inch by 64ths, mounted.
- No. 6.—Set Drills, straight shanks, $\frac{1}{8}$ to $\frac{1}{2}$ inch by 32ds, mounted.
- No. 7.—Set Drills, from No. 60 w. g. to $\frac{3}{8}$ inch, mounted.
- No. 8.—Set Drills, steel wire gauge, from No. 1 to 60, mounted.
- No. 9.—Half Set Drills, alternate Nos. from 1 to 60, mounted.
- No. 10.—Jeweler's Set of 36 Drills, No. 30 ($\frac{1}{8}$ inch) to No. 65, steel wire gauge, mounted in a mahogany case with cap.
- No. 11.—Set of Taper Shank Drills, $\frac{3}{8}$ to 2 inches by 32ds.
- No. 12.—Set Machine Bits, $\frac{1}{8}$ inch to $\frac{1}{2}$ inch, mounted, varying by 32ds.
- No. 13.—Set Bit Stock Drills, $\frac{1}{8}$ to $\frac{1}{2}$ by 32ds, $\frac{1}{2}$ to $\frac{3}{4}$ by 16ths, boxed.

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SOLID REAMER.

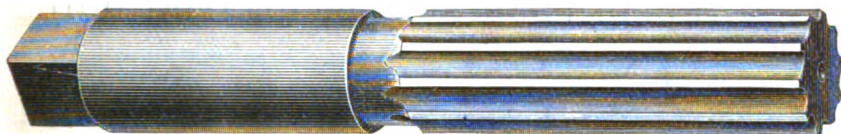


Fig. 481.

CHUCK REAMER.

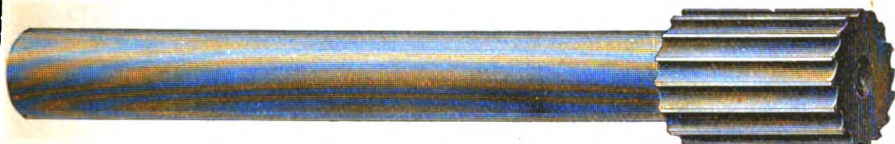


Fig. 482.

TAPER REAMER.



Fig. 483.

SHELL REAMER.

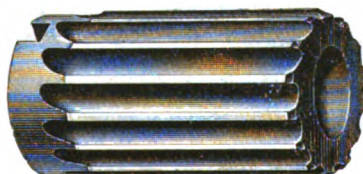


Fig. 484.

TWIST DRILL GRINDING MACHINE.

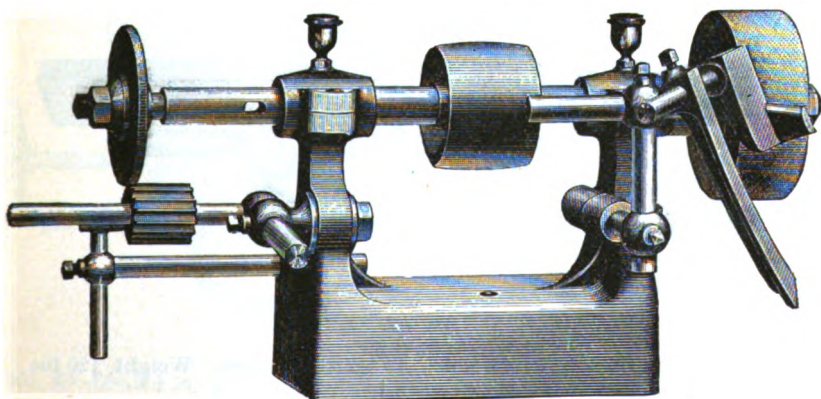


Fig. 485.

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UPRIGHT SELF-FEEDING BLACKSMITHS' DRILLS.

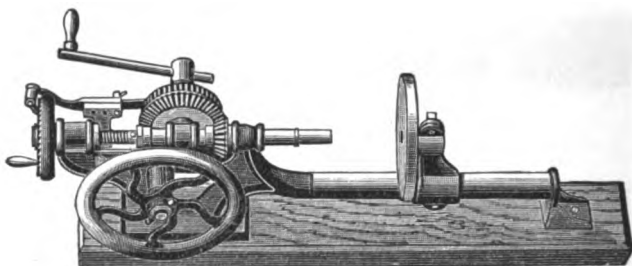


Fig. 486.

No. 0. Drills $\frac{1}{8}$ inch to $\frac{3}{8}$ inch hole. Length, 26 inches. Weight, 30 lbs.

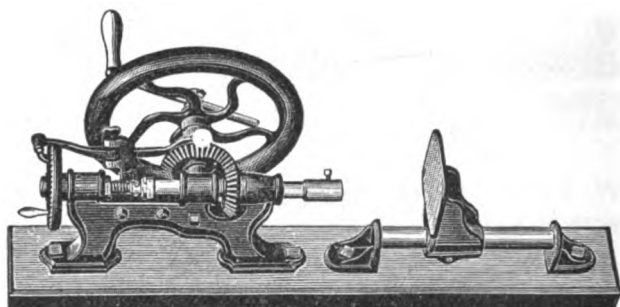


Fig. 487.

No. 1. Drills $\frac{1}{4}$ inch to $\frac{1}{2}$ inch hole. Length, 42 inches. Weight, 98 lbs.

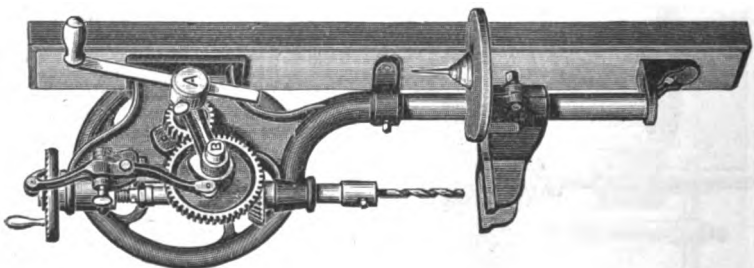


Fig. 488.

No. 1 $\frac{1}{2}$. Drills $\frac{1}{2}$ inch to 1 inch hole. Length, 44 inches. Weight, 120 lbs.

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BLACKSMITHS' DRILLS *(Continued).*

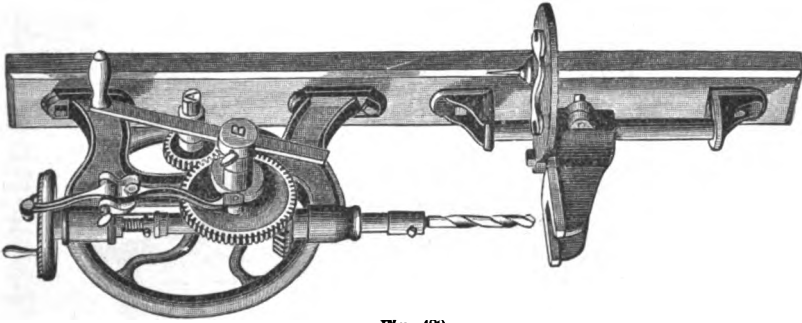


Fig. 489.

No. 2.—Drills $\frac{1}{4}$ to $1\frac{1}{2}$ inch holes. Weight, 160 lbs. Length, 54 inches ;

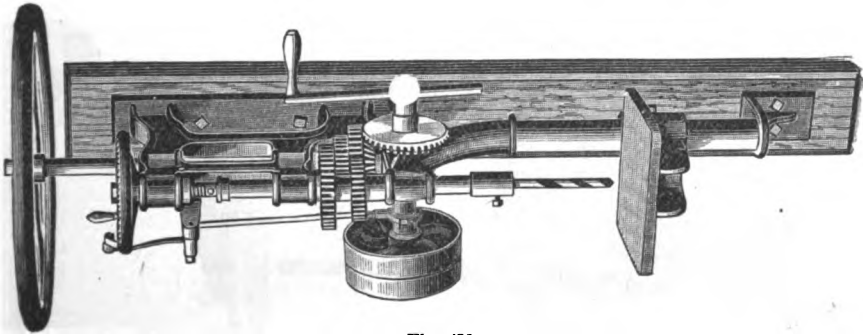


Fig. 490.

No. 3.—Drills $\frac{1}{4}$ to $1\frac{1}{2}$ inch holes. Weight, 250 lbs.

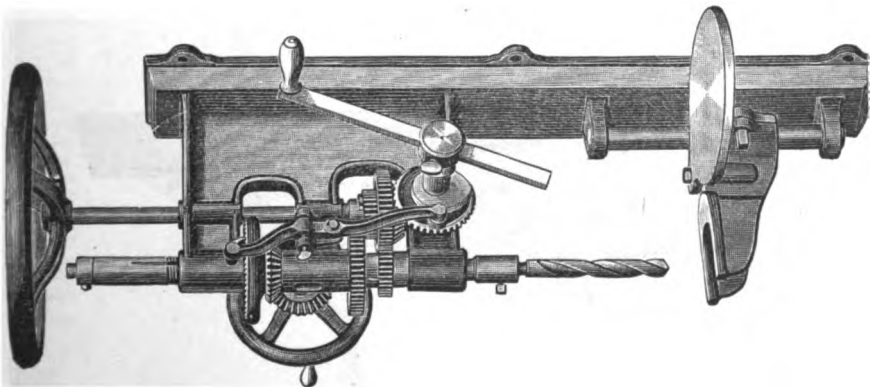


Fig. 491.

No. 4.—Drills $\frac{1}{4}$ to $1\frac{1}{2}$ inch holes. Length, 54 inches. Weight, 190 lbs.

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FOR PRICES SEE ACCOMPANYING LIST.

BLACKSMITHS' DRILLS *(Continued).*

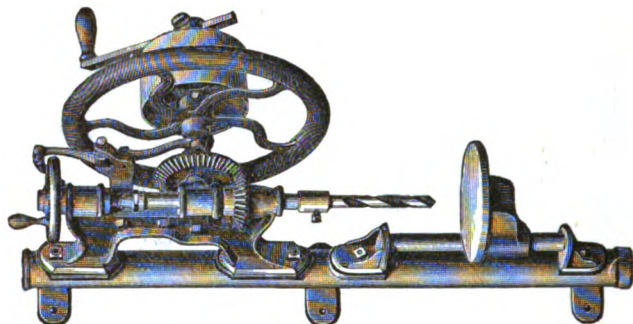


Fig. 492.

No. 6.—Drills $\frac{1}{4}$ to $\frac{3}{4}$ inch holes. Weight, 123 lbs.

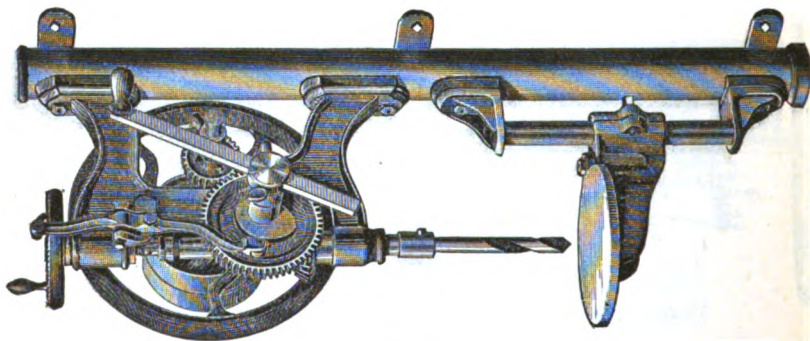


Fig. 493.

No. 7.—Drills $\frac{1}{4}$ to $1\frac{1}{4}$ inch holes. Weight, 200 lbs.

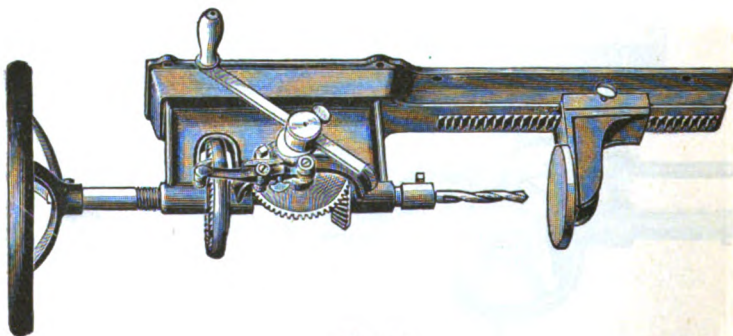


Fig. 494.

Boss.—Drills $\frac{1}{4}$ to $\frac{7}{8}$ inch holes. Length, 44 inches. Weight, 110 lbs.

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FOR PRICES SEE ACCOMPANYING LIST.

Horizontal Drills.

No. 4.

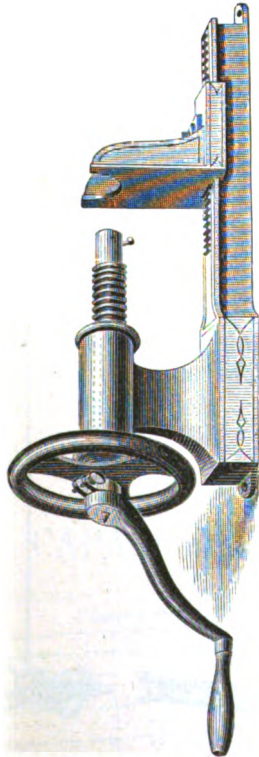


Fig. 497.

Length, 26 inches. Weight, 33 lbs.

No. 5.

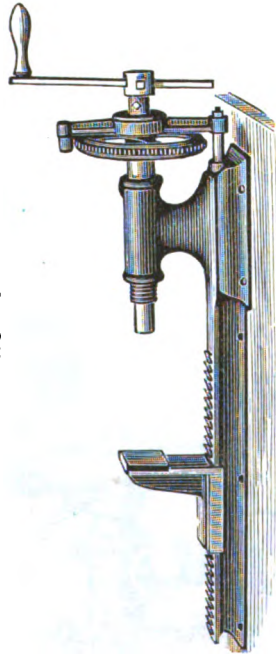


Fig. 498.

Length, 44 inches. Weight, 115 lbs.

No. 2.

Same Style as Fig. 498. Length, 83 inches. Weight, 45 lbs.

Upright Bench Drills.

No. 8.

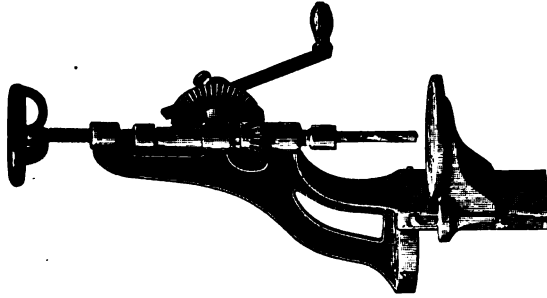


Fig. 496.

Drills $\frac{1}{8}$ to $\frac{3}{4}$ in. hole.

Weight, 55 lbs.

No. 9.

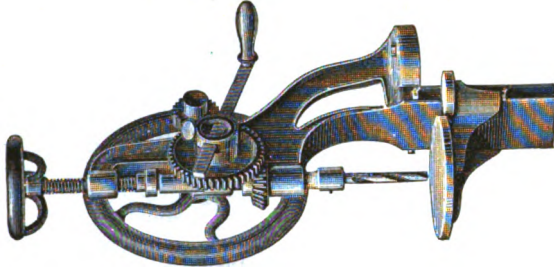


Fig. 495.

Drills $\frac{1}{8}$ to $\frac{1}{4}$ in. hole.

Weight, 75 lbs.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PATENT PORTABLE DRILLING MACHINES.

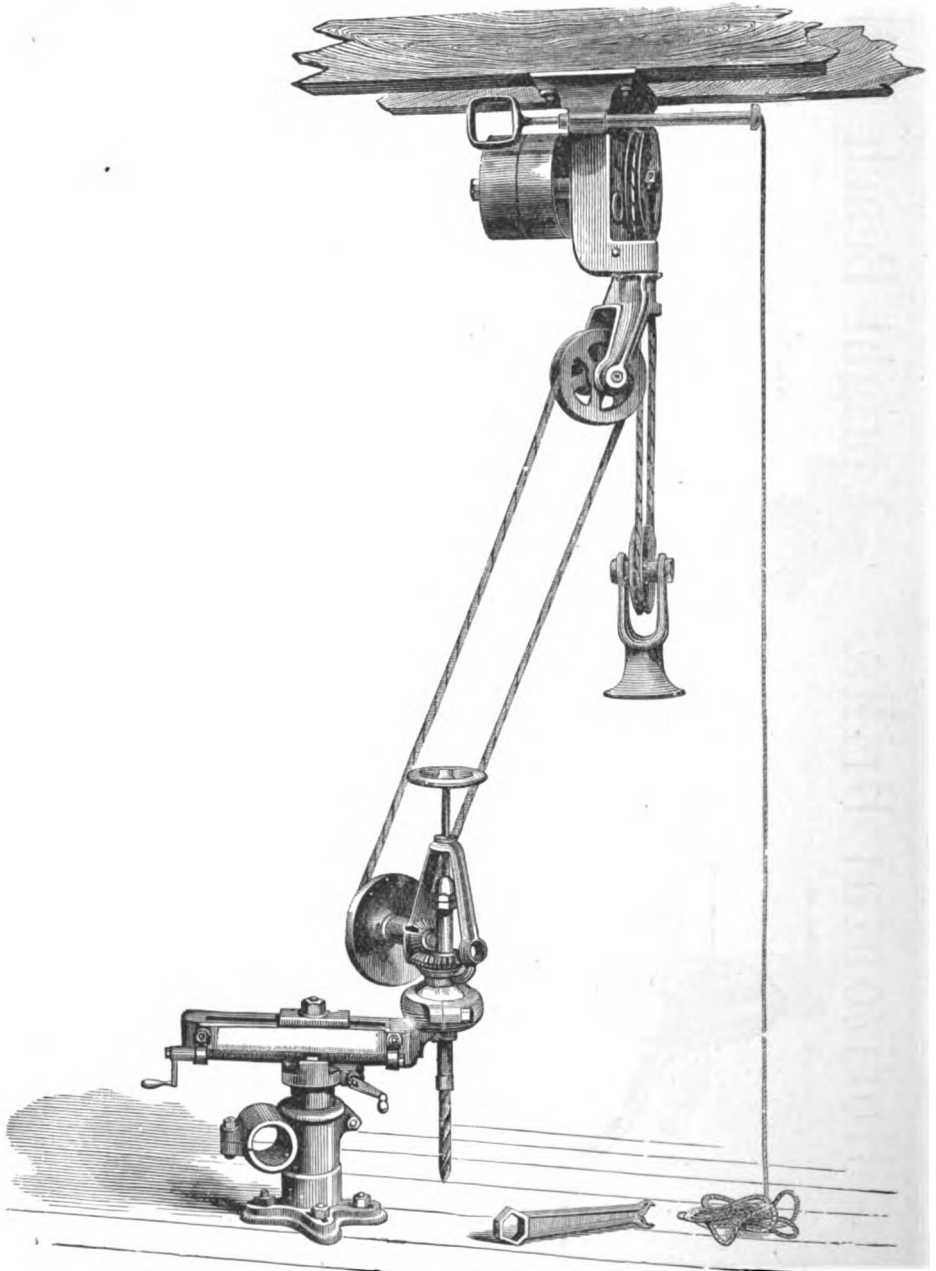


Fig. 499.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

DESCRIPTION

— OF —

PORTABLE DRILLING MACHINES.

The operation of the Machine is as follows:—The counter hanger is bolted to the ceiling or other convenient place, and receives power from the "line shaft" by a flat belt on the fast and loose pulleys. The frame carrying the "idlers" rotates on a hollow stud, through which the round belt passes to the grooved driving pulley. The rotation of this frame permits the belt to be led to the Drilling Machine in any direction, radially, from the hanger, while the rise and fall of the weighted "idler" permits it to be led to and point within the scope of this rise and fall—say ten or fifteen feet or more. By inserting sections of belt, by means of the hook couplings, any distance can be reached.

The base of the Drilling Machine is intended to be bolted or clamped to the piece to be drilled. The height of the post can be adjusted to suit the different lengths of drills and chucks used in the spindle. The radial slotted arm is fastened to the post by the stud and nut; the position of the drill being adjusted by the screw which travels the arm, and the worm and tangent-wheel which rotates it on the post. When it is required to drill parallel with the base, the post is held by the clamp bearing on the side of the base. There is a shoulder turned on the bottom of the ball on the gear frame, and a half collar fitted to it and bolted on the arm; this keeps the spindle square with the base. When this half collar is removed, the spindle can be set to an angle in any direction.

When the Drilling Machine is not being used on the floor, it serves the purpose of a bench drill press.

CAPACITIES AND DIMENSIONS.

Number.	Largest Hole it will Drill.	Depth of Feed.	Largest Swing.	Smallest Swing.	Weight.
1.....	1 inch.	6 inches.	33 inches.	11 inches.	125 pounds.
2.....	1½ "	6 "	43 "	13 "	200 "
3.....	2 "	8 "	43 "	13 "	240 "
4.....	8 "	13 "	56 "	16 "	390 "

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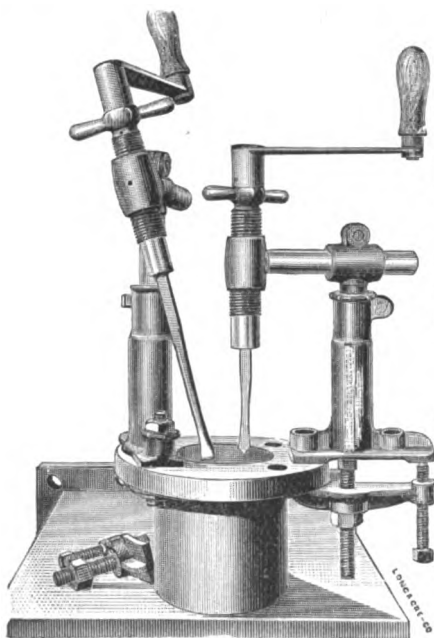


Fig. 500.

Portable Hand Drill No. 1.

These Drills are made entirely of cast steel.

The shape of parts and distribution of metal insure a maximum of strength and stiffness with a minimum of weight.

By using the bottom clamp and stud they can be fastened to a bench or the flange of a casting; and, without clamp and stud, they can be bolted or clamped to any flat surface.

DIMENSIONS.

No. 1 will drill up to $\frac{1}{4}$ inches; feed of spindle, $2\frac{1}{4}$ inches; vertical adjustment, 4 inches; largest radius, 18 inches; smallest radius, 4 inches.

No. 2 will drill up to $\frac{1}{2}$ inches; feed of spindle, $3\frac{1}{4}$ inches; vertical adjustment, 5 inches; largest radius, 19 inches; smallest radius, 8 inches.

Portable Hand Drill No. 2.

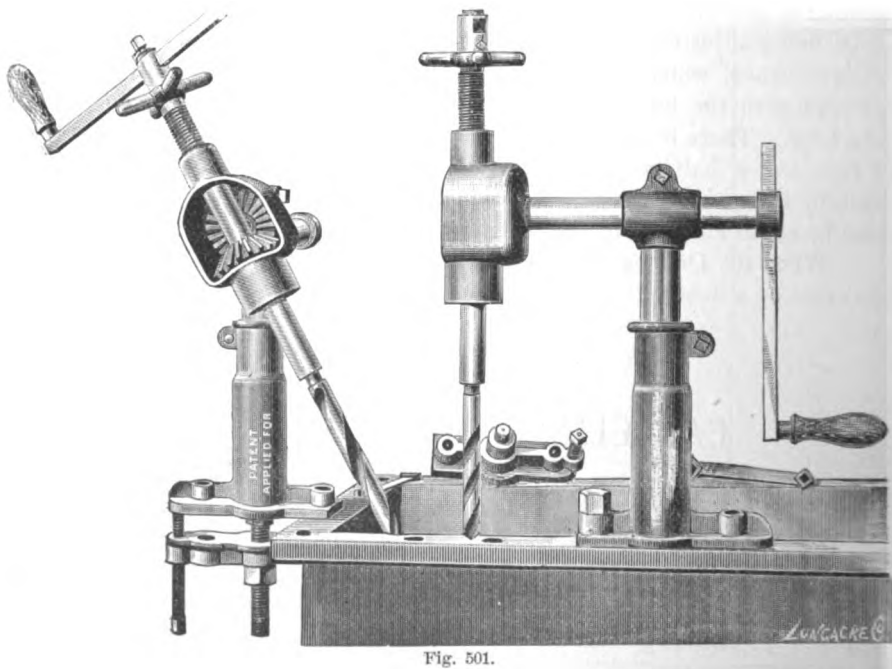


Fig. 501.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HUNTER'S PATENT HAND DRILL.

PATENTED APRIL 5, 1870.

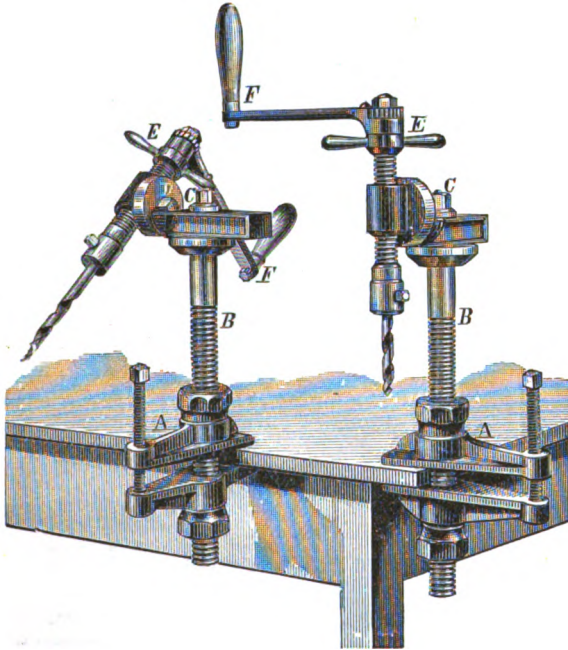


Fig. 502.

This Drill is so constructed that it CAN BE WORKED BY CRANK OR RATCHET, and WILL DRILL AT ANY ANGLE DESIRED, is readily attached to any kind of work, and is made of the

Best Material and Workmanship.

An indispensable tool for those engaged in putting up IRON FRONTS, IRON STAIRS, IRON BRIDGES, MARINE AND LOCOMOTIVE ENGINE BUILDERS, MACHINE BUILDERS, MANUFACTURERS, REPAIR SHOPS, PIPE AND GAS FITTERS, and all WORKERS IN METALS

SETS OF DRILLS FURNISHED TO ORDER.

No. 1 Drills, up to $\frac{1}{4}$ inch hole.....	11 lbs. weight.
" 2 " " 1 "	26 " "
" 3 " " 1 $\frac{1}{2}$ "	53 " "

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE Improved Patent Universal Angular and Ratchet Drilling Machine.

These Drilling Machines are now made of steel, and are first-class in all respects. For repair work in mills they are almost indispensable, as they can be attached to a broken machine without taking it apart, and swung around to drill at any angle.

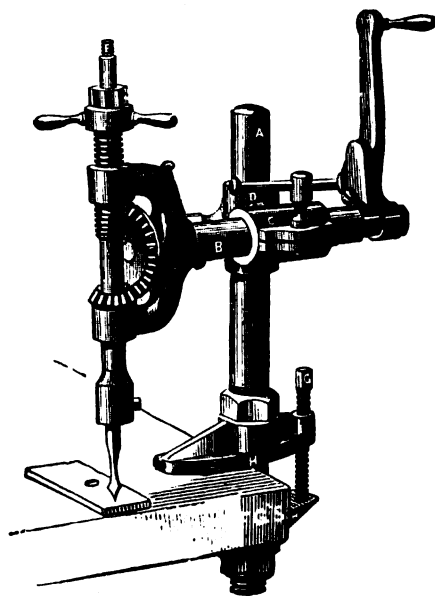


Fig. 503.

They will work at any angle. By placing the crank on the drill spindle, it will work with a ratchet or without. We send a chuck with each machine which will hold 1-16 to $\frac{1}{4}$ inch drills.

- No. 1. Weight, 26 lbs. Drills up to $\frac{1}{4}$ inch hole.
- No. 2. " 52 lbs. Drills up to 1 inch hole.
- No. 3. " 106 lbs. Drills up to $1\frac{1}{4}$ inch hole.

With two sets of gears (making either speeded or back geared machine), extra. These gears are for No. 2 Machine only.

HAND DRILL, No. 1.

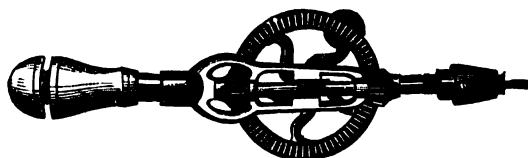


Fig. 504.

- No. 1. Single Gear, hollow handle, nickel-plated.
- No. 1 B. Double Gear, same chuck.

Six Drill Points with each of the above drill stocks.

These Drill Stocks are made of Malleable Iron, with steel spindle, and rose-wood head and handle. The jaws are of forged steel, and will hold perfectly any size drills named above.

They are the only drill chucks in use which will hold Morse Twist Drills from 1-32 to $\frac{1}{8}$ inch. No. 2. Same style for drills from $\frac{1}{8}$ to $\frac{1}{4}$.

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FOR PRICES SEE ACCOMPANYING LIST.

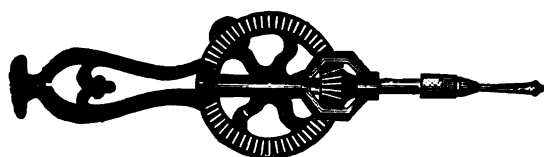


Fig. 505.

Hand Drill, No. 4.

This Drill Stock is eight inches in length and weighs eight ounces. It is made of iron, with rosewood handle and brass chuck for holding the drill points. This chuck is made on a new plan, and it centers and holds the the drill perfectly. With

each drill stock we send a box containing six superior drill points of various sizes.

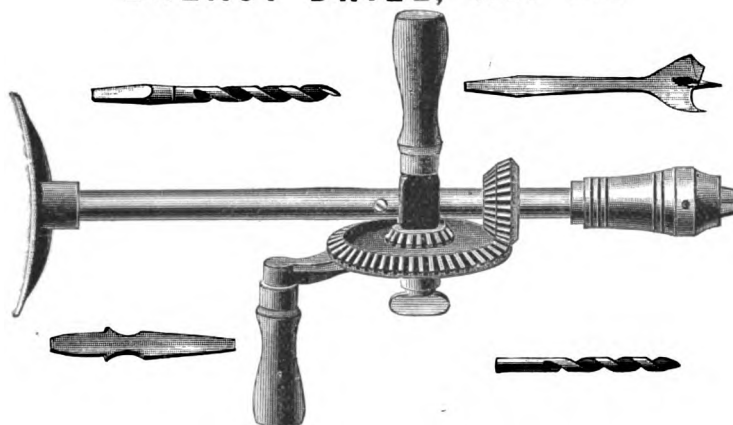
BREAST DRILL, No. 12.

Fig. 506.

These tools are not sold with the drill stock, but are only put in to show the shape of shanks which the chuck will hold.

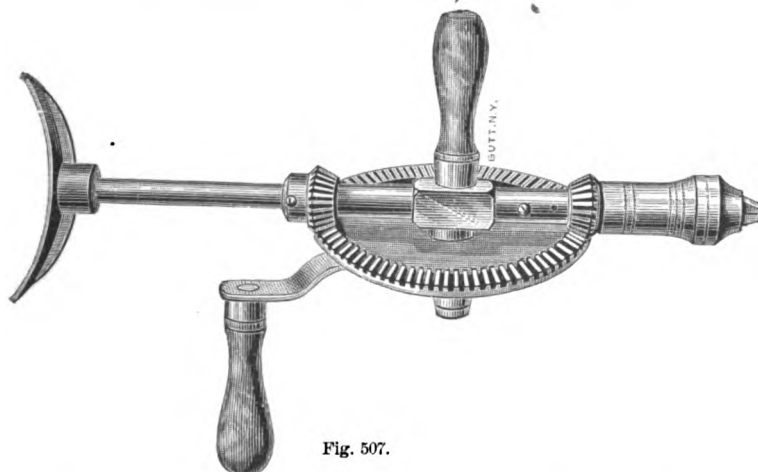
BREAST DRILL, No. 13.

Fig. 507.

This is the largest size Drill in market, the drive-wheel being 6 inches in diameter, giving a speed of $4\frac{1}{2}$ to 1. It is double-gearred and most perfect in every part. It has Cut Gears, Steel Stock, Rosewood Handles, Steel Jawed Chuck which will hold any size square and round tool shanks. It is heavily nickel-plated and really the most expensive Breast Drill in the market.

221 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

RATCHET BRACE.

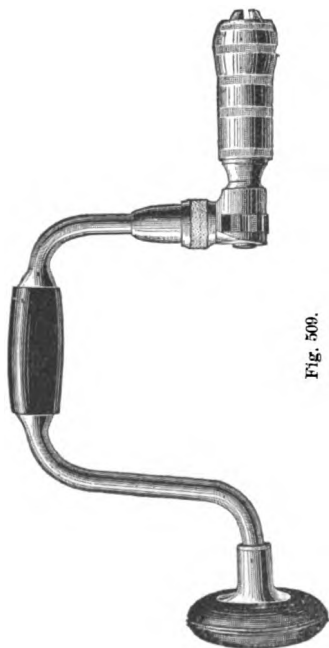


Fig. 500.

Number	16	18	20
Sweep	8	10	12 inch.

POLISHED.

RATCHET BRACE AND BREAST DRILL.

Can be used without breast drill if desired.

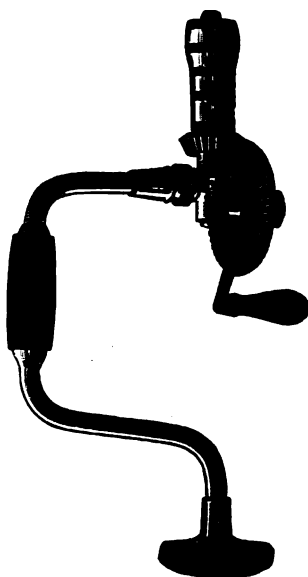


Fig. 511.

Number 80, one size only.

PATENT BIT BRACE.

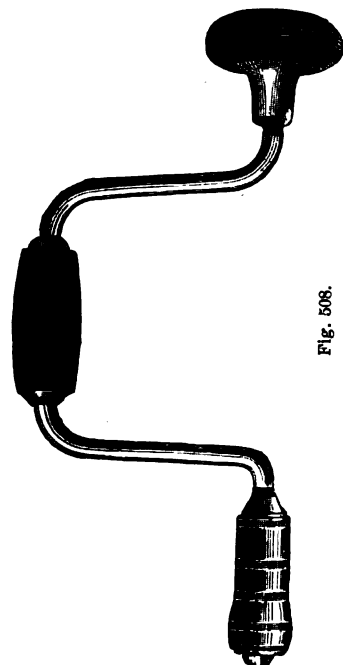


Fig. 508.

Number.....	7, 9, 11,	114, 118, 112, 111, 110
Sweep.....	8, 9½, 11,	6, 8, 10, 12, 14 inch.

NICKEL PLATED.

ADJUSTABLE SOCKET BIT BRACE WRENCH.

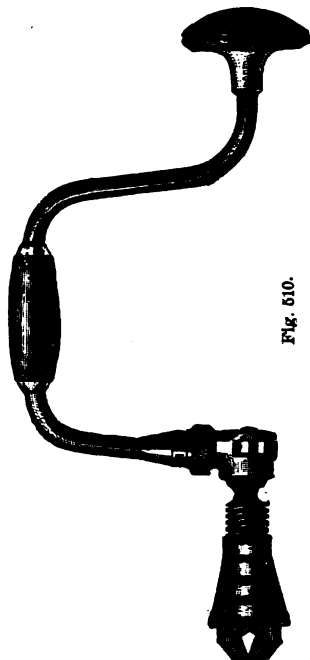


Fig. 510.

To hold Nuts from $\frac{3}{4}$ to 1½ inch square.
No. 27, one size only.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

HAND, PANEL

AND

RIP SAWS.

Lightning-Champion

CROSS-CUT

— S A W S. —

HACK SAWS

AND

FRAMES.



Fig. 512.

Sizes, 8 10 12 14 inch.

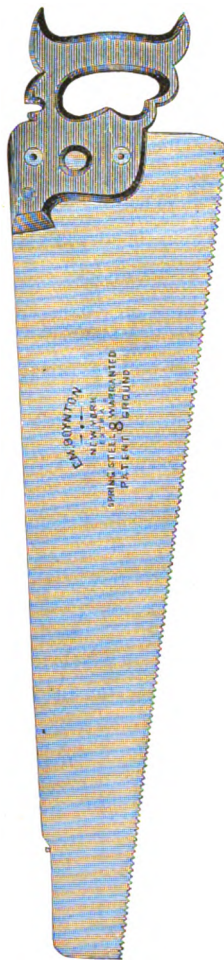


Fig. 518.

Sizes, 16 18 20 22 24 26 28
30 inch.

"Jackson," and "Extra"
Patterns.

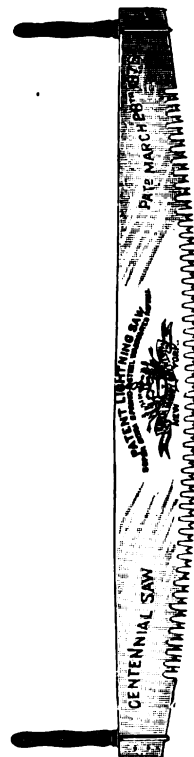


Fig. 514.

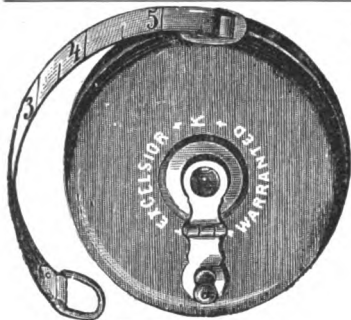
Extra spring steel, patent
tempered, extra ground.

PATENT EXTENSION-ROD
HANDLES EXTRA.

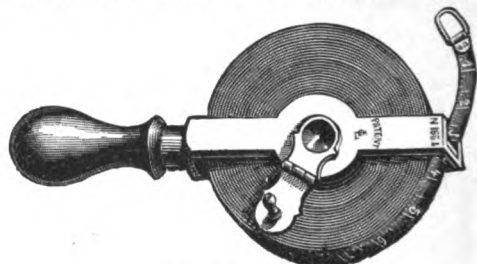
22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

MEASURING TAPES.



No. 601. Fig. 515.



No. 603. Fig. 516.

601. Excelsior Metallic Tapes, $\frac{1}{8}$ inch wide, of best linen thread, interwoven with brass wire, in red leather case, with folding handle. Div. 10ths and links, or div. 12ths and links. 33, 50, 66, 75 and 100 feet.

601—2. Excelsior Metallic Tapes, $\frac{5}{8}$ inch wide, as above, without case. Div. 10ths and links, or div. 12ths and links. 50, 66, 75 and 100 feet.

602. Excelsior Steel Tapes, $\frac{1}{8}$ inch wide, very strong and pliable, in red leather case, with folding flush handle. Div. 10ths and links, or div. 12ths and links, or div. 12ths and meter. 50, 66, 75 and 100 feet.

602—1. Excelsior Steel Tape, same as 602, divided only on one side. Div. 10ths or 12ths. 50, 66, 75 and 100 feet.

603. Excelsior Steel Tape, $\frac{1}{8}$ inch wide, on patent brass frame, with handle; handy in rolling up or unrolling the tape; very good to be used in mines. Div. 10ths or 12ths. 50 and 100 feet.

604. Excelsior Steel Tape, $\frac{1}{8}$ inch wide, on iron frame. This tape is of the same quality as Nos. 602, 603. Div. 10ths or 12ths. 50 and 100 feet.

ADZE-EYE NAIL HAMMERS.

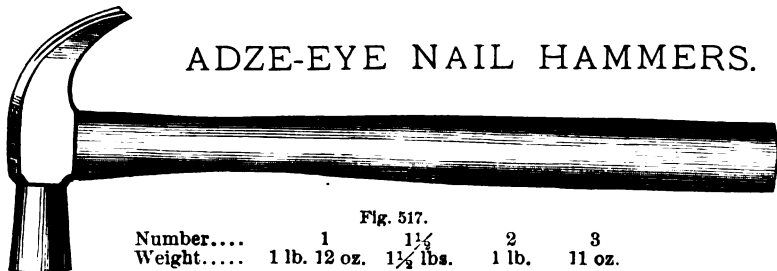


Fig. 517.

Number....	1	$1\frac{1}{2}$	2	3
Weight.....	1 lb. 12 oz.	$1\frac{1}{2}$ lbs.	1 lb.	11 oz.

SHINGLING HATCHET.

BROAD OR BENCH HATCHET.

BROAD AXE.

WESTERN PATTERN.

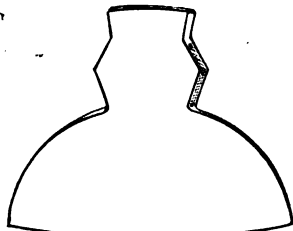


Fig. 518.

Fig. 518. One size only.

Fig. 519 Numbers 1, 2, 3.

Fig. 520. Numbers 2, 3, 4, 5, 6, 7.
Cut $4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6, $6\frac{1}{2}$, 7 inches.

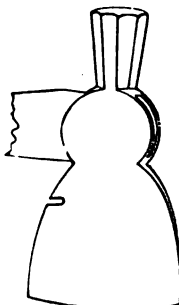


Fig. 519.

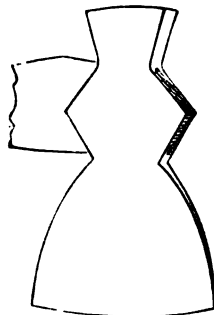


Fig. 520.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

AXES.

KENTUCKY PATTERN.

YANKEE PATTERN.



Fig. 521.

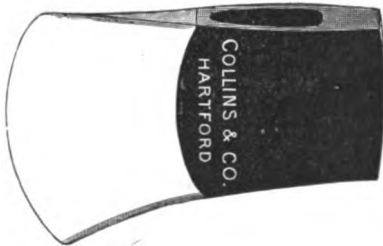


Fig. 522.

Assortm'ts, 6 to 6½ lbs. 4½ to 6 lbs. 4½ to 5½ lbs. Assortm'ts, 5 to 7 lbs. 4½ to 6 lbs. 4½ to 5½ lbs.
 " 8½ to 4½ lbs. 3 to 4 lbs. " 8½ to 4½ lbs. 8 to 4 lbs. 2½ to 3½ lbs.
 " 2 to 3 lbs.

RAILROAD ADZE.

SHIP AXE.

SHIP ADZE.

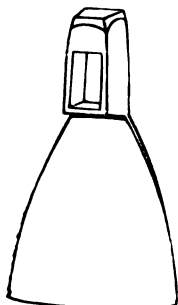


Fig. 523.



Fig. 524.

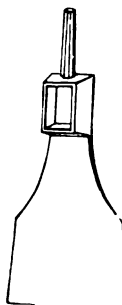


Fig. 525.

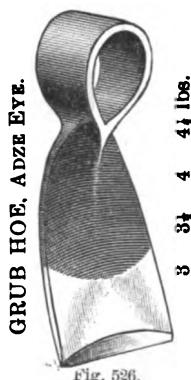


Fig. 526.

ADZE-EYE RAILROAD OR CLAY PICK.—Fig. 527.



Assortments 4 to 5. 5 to 6. 6 to 7. 7 to 8 lbs.

ADZE-EYE COAL MINER'S PICK.—Fig. 528.



Weights,

2 2½ 3 3½ lbs.

DRIFTING PICK.—Fig. 529.



Weights, 3 4

4½ 5 6 lbs.

POLL PICK.—Fig. 530.



Weights, 3½ 4 4½

5½ 6 6½ lbs.

All of above furnished with common eyes, if so ordered.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

SHOVELS.

"AMES" OR "GRIFFITH" BRANDS.

D HANDLE, SQUARE POINT, BACK STRAPPED SHOVEL.—Cast steel, black or polished



Fig. 581.

Nos.....1, 2, 3, 4, 5, 6, 7, 8, 10, 12.

D HANDLE, ROUND POINT, BACK STRAP SHOVEL.—Cast steel, black or polished.



Fig. 582.

Nos.....2, 3, 4.

D HANDLE, MOULDERS' SHOVEL.—Cast steel, polished.



Fig. 583.

No.....2.

D HANDLE SCOOP.—Cast steel, black, half polished or all polished.



Fig. 584.

Nos.....2, 3, 4, 5, 6, 7, 8.

D HANDLE SPADE, BACK STRAP.—Cast steel, black or polished.



Fig. 585.

Nos.....1, 2, 3, 4.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

LONG HANDLE, SQUARE POINT SHOVEL. Cast Steel, Black or Polished.

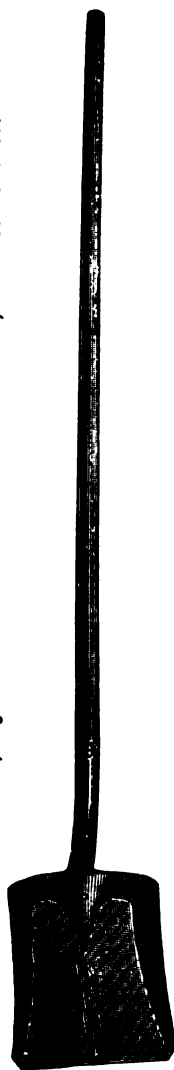


Fig. 586.

Nos. 1 2 3 4 5.

LONG HANDLE, ROUND-POINT SHOVEL. Cast Steel, Black or Polished.



Fig. 587.

Nos. 1 2 3 4.

LONG HANDLE FURNACE SCOOP. Cast Steel.

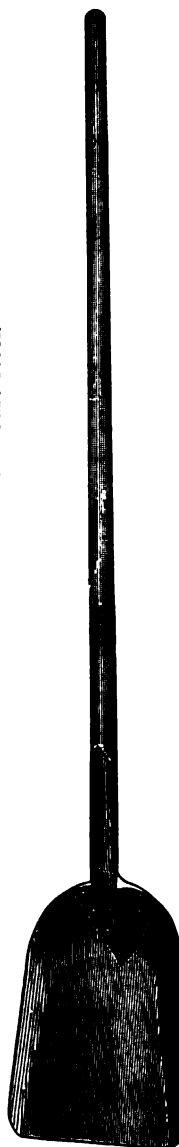
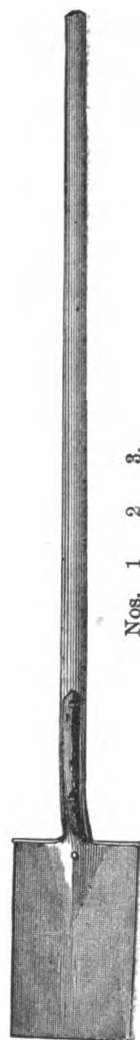


Fig. 588.

Nos. 2 3 4 5 6 7 8.

LONG HANDLE SPADE. Cast Steel.



Nos. 1 2 3,

Fig. 589.

Also, HUSSEY, BINNS & CO.'S
HAMMERED CRUCIBLE CAST STEEL SHOVELS AND SCOOPS.
(SEE PRICE LIST.)

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

MALLEABLE IRON SCREENING SCOOP.

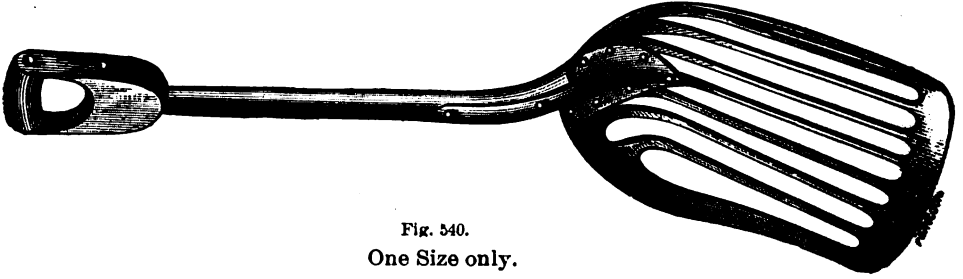


Fig. 540.
One Size only.

HANDLES.

HICKORY AXE HANDLE.



Fig. 541.
Sizes, 22 to 36 inch. Extra, No. 1 and No. 2.

HICKORY BROAD AXE HANDLE.

26 inch.



Extra, and
No. 1.

Fig. 542.

HICKORY ADZE HANDLES. Extra, No. 1 and No. 2.

COMMON HICKORY PICK HANDLES.

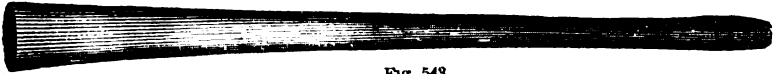


Fig. 543.

36 inch. Extra, No. 1 and No. 2.

HICKORY DRIFTING PICK HANDLE,

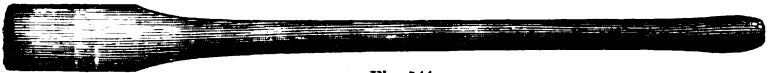


Fig. 544.

30 to 36 inch. Extra, No. 1 and No. 2.

HICKORY SLEDGE AND MAUL HANDLE.



Fig. 545.

24 to 40 inch. Extra, No. 1 and No. 2.

MACHINISTS', ENGINEERS' AND CARPENTERS' HICKORY HAMMER HANDLE.



Fig. 546.

13 to 24 inch. Extra.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Wooden Canal or Railroad Barrow—Bolted Wheel.

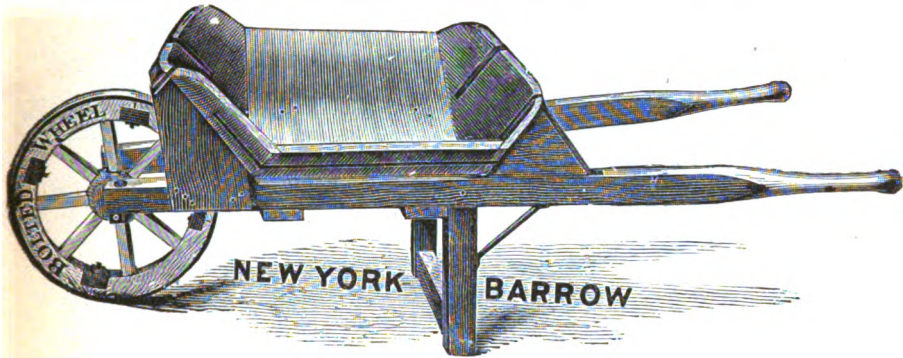


Fig. 547.

Wooden Canal or Railroad Barrow—Patent Wheel.

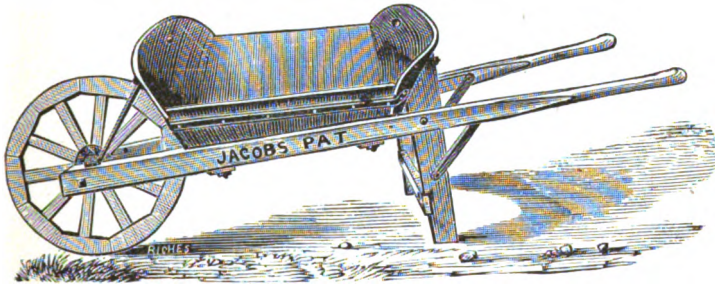


Fig. 548.

Iron and Steel Barrows

FOR COAL OR DIRT.

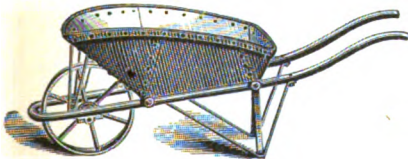


Fig. 549.

CAPACITIES—IRON.

		WEIGHT.
No. 4.	3 Cubic ft. of earth.....	65 lbs.
" 4.	3 " " " ".....	70 "
" 5.	4 " " " ".....	80 "
" 6.	5 " " " ".....	85 "
" A.	325 lbs. of coal.....	135 "
" B.	400 " " ".....	145 "
" C.	260 " " ".....	135 "
" D.	300 " " ".....	135 "
" D No. 2.	350 lbs of coal.....	
" E.	4 Bushels Coke.....	126 "

Iron and Steel Barrows

FOR METAL.

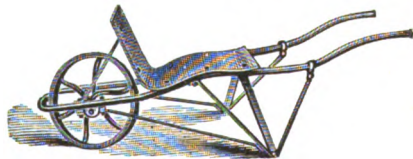


Fig. 550.

No. F.	Weight.....	80 lbs.
" G.	" ".....	80 "
" H.	" ".....	78 "
" I.	" ".....	— "
Steel, Class C.	.....	90 "

STEEL BARROWS.—Fig. 549.

		WEIGHT.
No. 1, Class A,	3 cubic ft. of earth.....	55 lbs.
" 2,	" " " ".....	60 "
" 3,	" " " ".....	65 "
" 1, Class B,	200 lbs. coal.....	65 "
" 2,	250 " " ".....	70 "
" 3,	325 " " ".....	80 "

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FOR PRICES SEE ACCOMPANYING LIST.

TWO-WHEELED BARROW.



Fig. 551.

Holding 500 lbs.

COKE CAR.

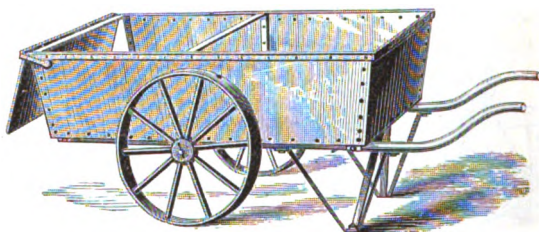


Fig. 552.

Prices and Sizes on application

CHARGING BARROW.

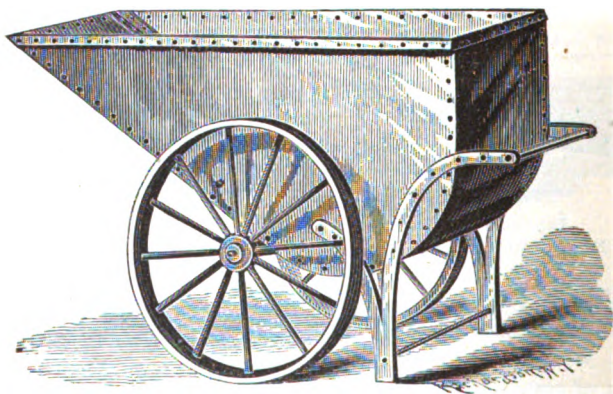


Fig. 553.

We manufacture three sizes, and various styles, of above barrows; for use in iron furnaces for conveyance of coke, limestone and ore.

All orders should give the height of curb, so that the wheels may be made of such diameter as will ensure the charge being properly dumped.

Sizes and prices will be furnished on application.

22 CORTLANDT STREET, NEW YORK.

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SCRAPERS OR SCOOPS.

ROAD OR CONTRACTORS' PLOWS.



Fig. 554.



Fig. 555.

Fig. 554. Size, 24 to 39 inches wide.
" 555. " 30, 33, 36 "



Fig. 556.



Fig. 557.

Fig. 556. Grading Plow.
" 557. Contractors' Plow.
CARTS.

HAND TRUCKS.

BOX.

BAG.



Fig. 558.



Fig. 559.

SIZE OF WHEELS.
Fig. 558. No. 0. 5 6 7 8 9 10 12 14 inch.
" 559. No. 1. 1 2 3 4 5 6 "

BOX AND PLATFORM TRUCKS.

DIMENSIONS OF BOX AND, BAGGAGE TRUCKS.

Fig. 560. 16 x 24 inches.

" 561. No. 1, 8 feet x 2 feet.
" 2, 3 " 2 in. x 2 " 2 in.
" 3, 3 " 4 in. x 2 " 4 in.
" 4, 3 " 6 in. x 2 " 6 in.
" 5, 3 " 8 in. x 2 " 8 in.
" 6, 3 " 10 in. x 2 " 10 in.

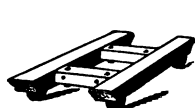


Fig. 560.

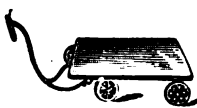


Fig. 561.

FOUR-WHEEL EXPRESS BARROW.

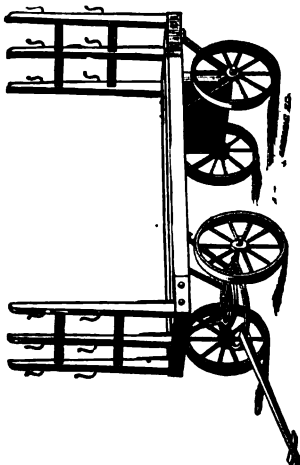


Fig. 564.

Size, No. 1. 8 feet x 24 inches.
" 2. 10 " x 24 "
" 3. 12 " x 28 "

SLOPING BACK BAGGAGE BARROW.

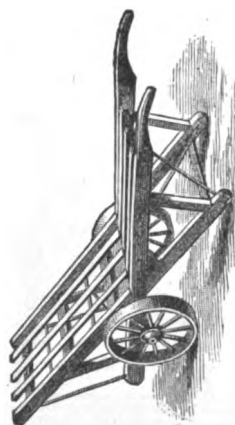


Fig. 565.

Size, No. 1. 6 feet x 24 inches.
" 2. 9 " x 27 "
" 3. 9 " x 30 "

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CROW BARS.

DOUBLE OR WEDGE.



Fig. 567.

PINCH BAR.



Fig. 568.

HACKLE BAR.

CLAW BAR.



Fig. 569.

TAMPING BAR.



Fig. 570.

PINCH BAR—WITH HEEL.



Fig. 571.

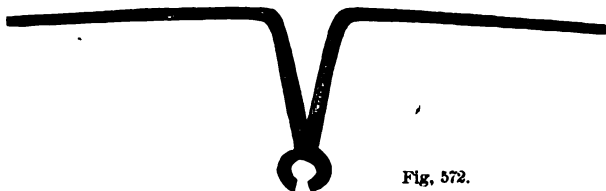
RAIL TONGS.

Fig. 572.

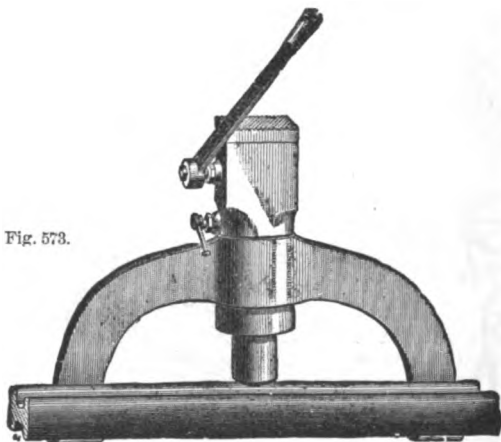


Fig. 573.

HYDRAULIC

RAIL BENDER.

Span, 20 24 24 inches.
Weight, 100, 150, 200 lbs.

Track Gauges.

WOOD, IRON SHOD,
OR ALL IRON.

Fig. 566.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

BRAHN'S DOUBLE ACTING RAIL STRAIGHTENER.

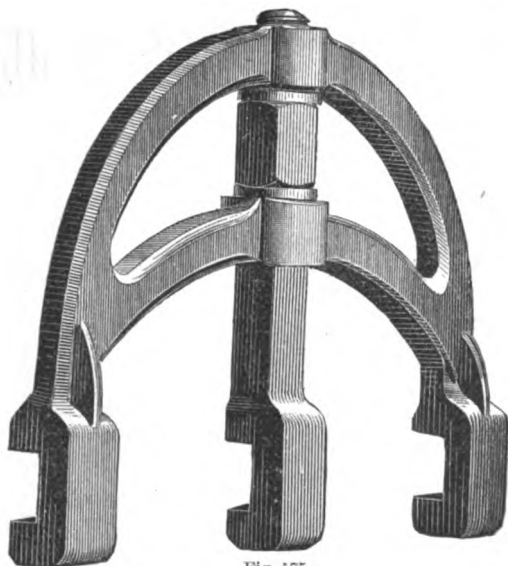


Fig. 575.

SCREW RAIL BENDER, OR JIM CROW.

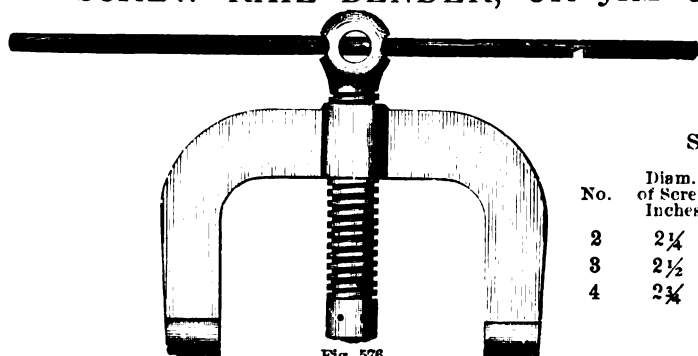


Fig. 576.

SIZES :

No.	Diam. of Screw. Inches.	Span. Inches.	Weight.
2	2¼	20	90 lbs.
3	2½	24	140 "
4	2¾	24	180 "

Williston's Patent Machine for Curving and Straightening Rails.

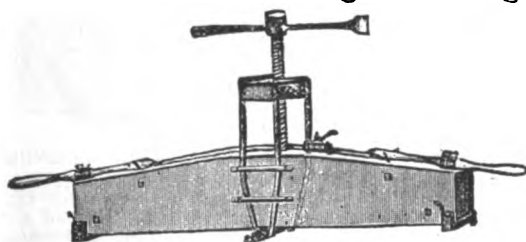


Fig. 577.

22 CORTLANDT STREET, NEW YORK:
FOR PRICES SEE ACCOMPANYING LIST.

WILLIAM'S PATENT Combination Ratchet Wrench and Drill.

Reversible Ratchet Wrench.

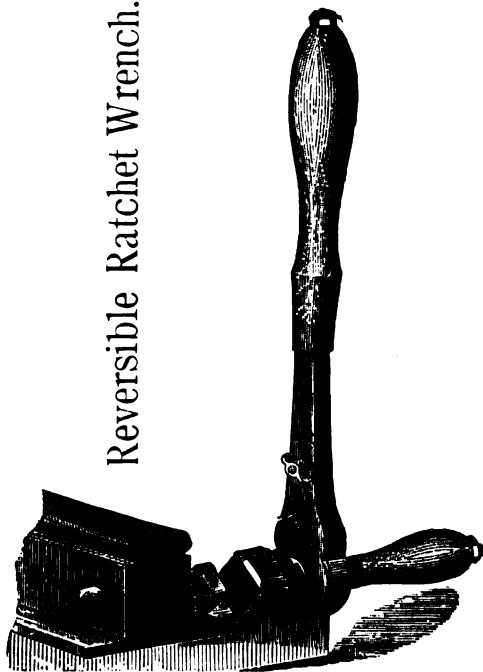


Fig. 578.

The same Wrench is used with clamp brace for drilling rail, while in position, allowing cars to pass during progress of re-pairing. This is the best tool for fishing broken or new rails without taking them out of the track.

MOORE'S RATCHET WRENCH.

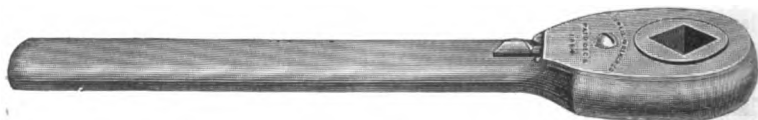


Fig. 579.
SECTIONAL VIEW.

GEAR.



Fig. 580.

LIST OF SIZES.

No. 1, 10 inch Lever.	Any size gear on the list.
No. 2, 12 " "	" " " "
No. 3, 15 " "	" " " "
No. 4, 18 " "	" " " "



Fig. 581.

LIST OF WRENCH-GEARS.

No. 1, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{1}{4}$ in. square nut,	$\frac{3}{4}$, $\frac{1}{2}$ in. hexagon.
No. 2, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{1}{4}$ " "	$\frac{3}{4}$, $\frac{1}{2}$, 1 " "
No. 3, $\frac{3}{4}$, $\frac{1}{2}$, 1, $1\frac{1}{4}$ " "	1, $1\frac{1}{4}$, $1\frac{1}{2}$ " "
No. 4, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2 " "	$1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$ " "

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THE VICTOR TRACK DRILL.

TO FASTEN OVER THE RAIL.

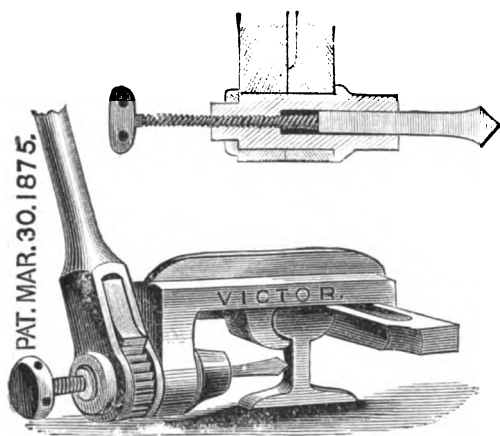


Fig. 582.

It is for the use of trackmen in drilling holes for fish-plate bolts, and is adapted to any height or size of rail. It is a top fastener, and can be removed instantly from the rail by knocking out the key which holds it. The drill is of $\frac{3}{4}$ steel, needs no fitting, and slides from the socket when the machine is drawn back, rendering it a perfectly safe top fastener. It is invaluable as a means of repairing broken rails, as they can be drilled in the track and fish-plates put on without drawing a spike. It weighs but 23 lbs., is very compact, is easily handled, drills rapidly, and can be thrown about in the most careless manner without injury.

THE "I X L" TRACK DRILL.

TO FASTEN UNDER THE RAIL.

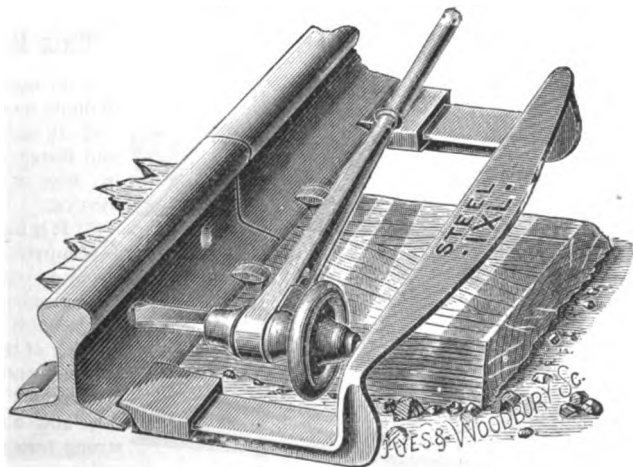


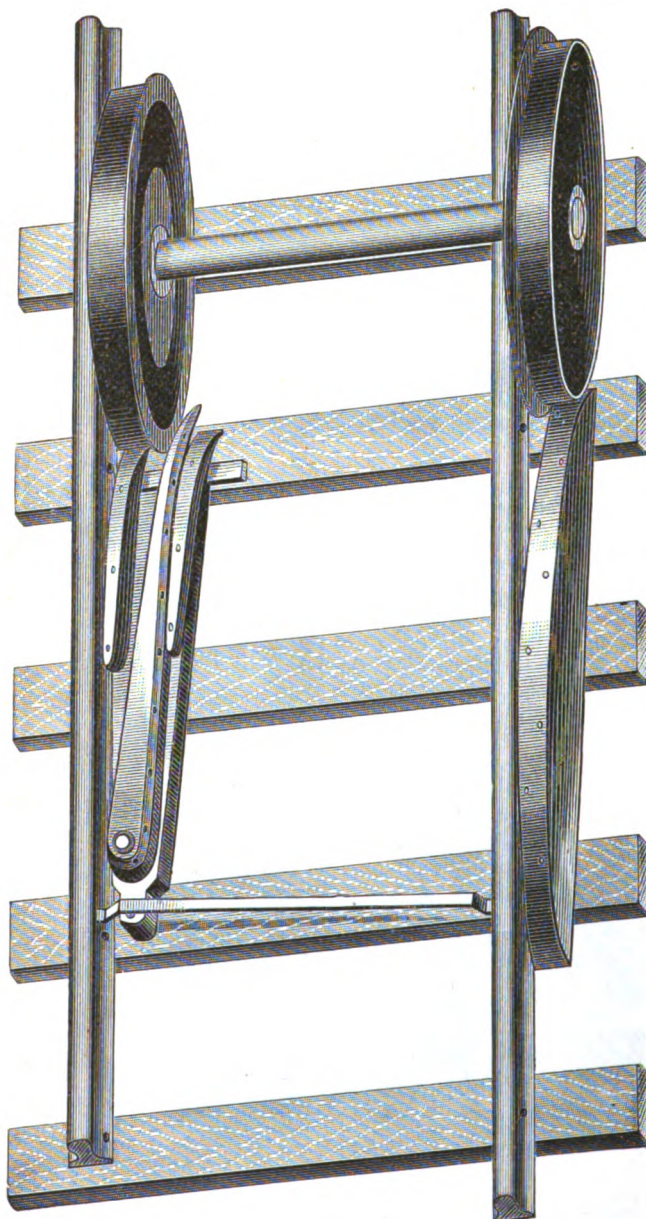
Fig. 583.

It is strong, light and easily adjusted. The clamp, being of steel, will not break. It drills the holes for a joint without drawing the spikes or moving the clamp. Adjustment from one hole to another is made more easily than with any similar tool. The ratchet may be used wherever a ratchet is needed, it being a ratchet drill with hand-feed wheel.

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FOR PRICES SEE ACCOMPANYING LIST

NEWCOMB'S CAR REPLACER.



Newcomb's Car Replacer is made of wood and wrought iron, and is the most convenient and perfect device now in use for replacing railway locomotives and cars on the track. The frog-like part of this Replacer, between the rails, is held in place at the forward end by spurs cutting into the cross ties, at the other end by an adjustable bar. It has side rails, inclining to the height of the road rails, to carry up the wheel, and a movable tongue, adjusted to either track rail, to guide the wheel on to the track. The outside part is a double inclined plane, high enough to carry the flange of the wheel over the rail, and sloping toward the rail.

This Replacer

- (1) Is absolutely sure to do its work.
- (2) It can be placed and fastened in position by ONE MAN IN ONE MINUTE.
- (3) It is light to handle — occupying but little space in carrying, yet strong enough to carry the heaviest locomotive.

Many of the best roads in the country are using Newcomb's Car Replacer, and all speak in strong terms of its excellence.

Fig. 584.

PATENTED MAY 19, 1874.

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FOR PRICES SEE ACCOMPANYING LIST.

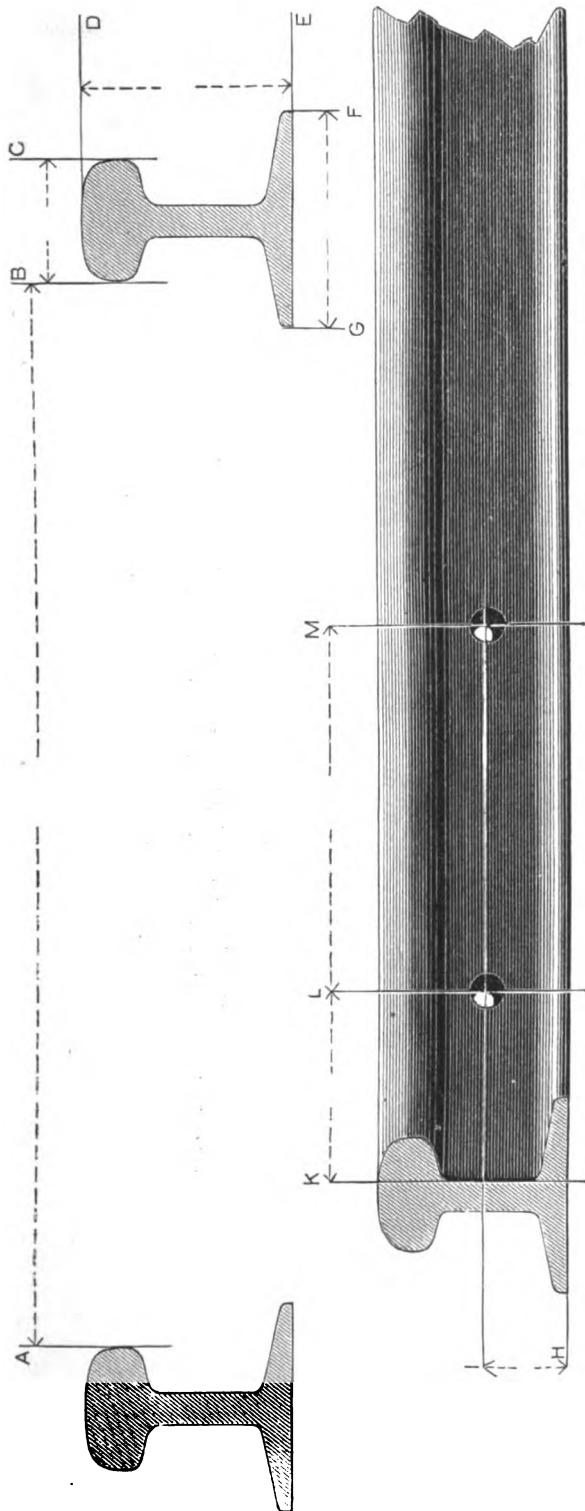


Fig. 5844.

MEASUREMENTS REQUIRED FOR SET OF SWITCH FIXTURES.

A-B. Gauge of Track. B-C. Head of Rail. D-E. Height of Rail. F-G. Base of Rail.
H-I. Center of Holes from bottom of Rail. K-L. Center of first Hole from end of Rail. L-M. Center to center of Holes. Diameter of bolts.....

Combination Patent Steel Rail Frog.

PATTERN "T."

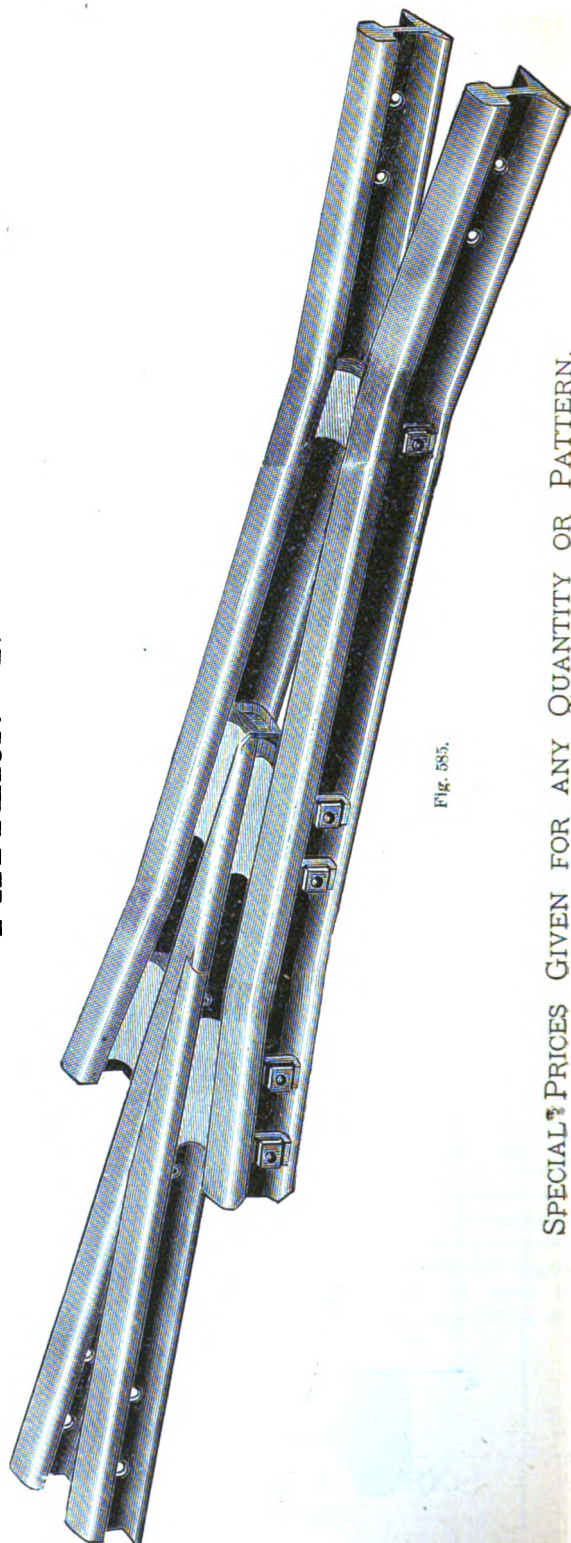


Fig. 585.

SPECIAL PRICES GIVEN FOR ANY QUANTITY OR PATTERN.

CONTINUOUS GUARD RAIL CROSSING.

PATTERN "X"

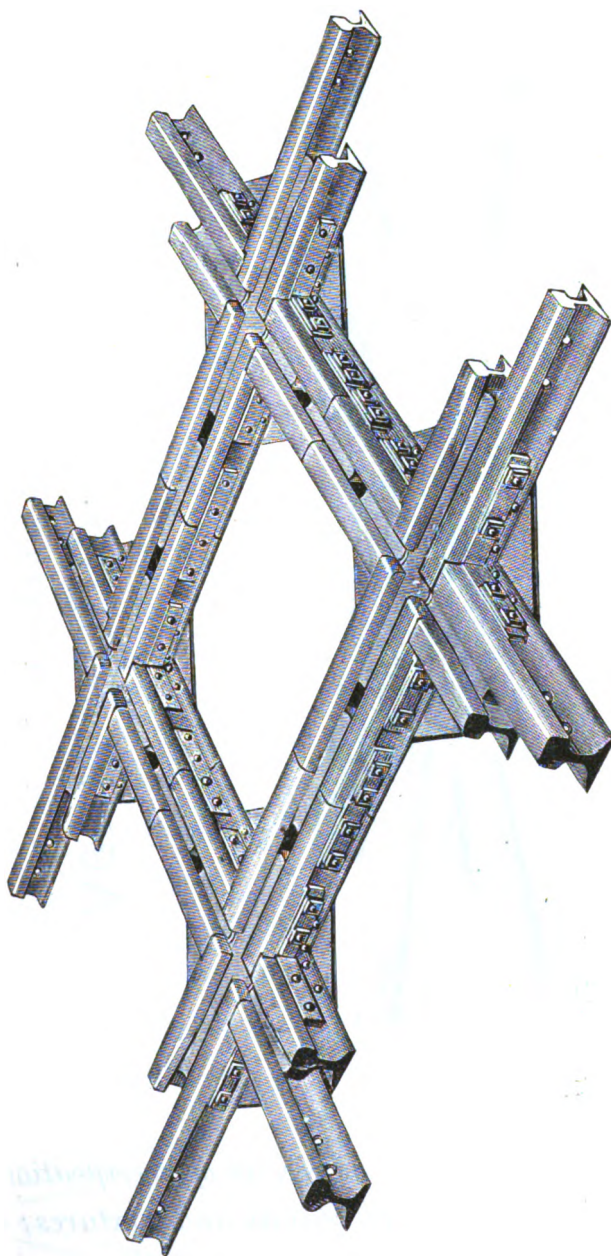


Fig. 596.

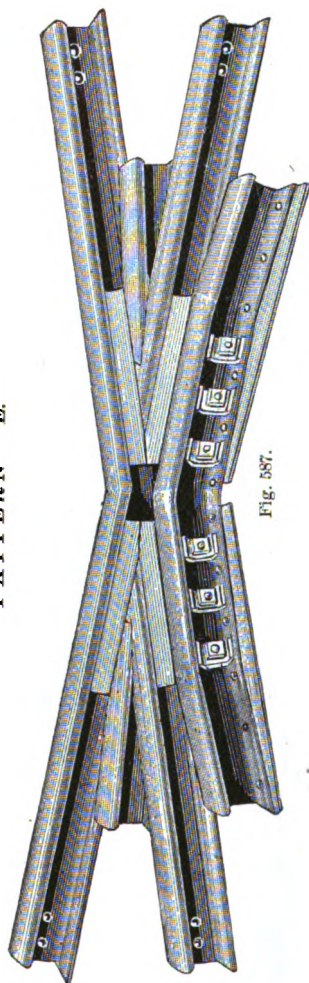
SPECIAL PRICES QUOTED FOR ANY QUANTITY OR SIZE.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

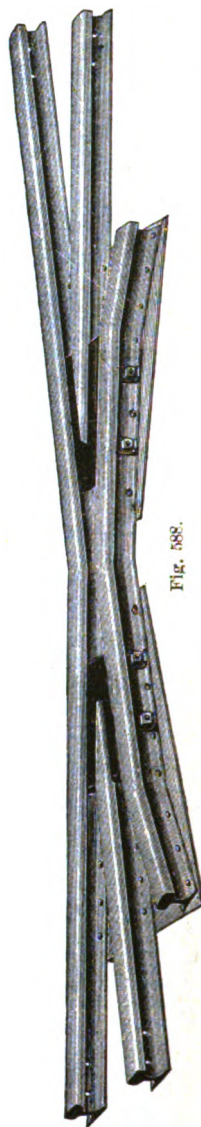
Obtuse Angle Crossing.

PATTERN "E."



Acute Angle Crossing.

PATTERN "D."



Special prices quoted, on receipt of specifications, for Frogs, Crossings, Switch Stands and Fixtures; also for Flat and T Rails, Fish Plates, etc.

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FOR PRICES SEE ACCOMPANYING LIST.

Table of Angles of Frogs.

Short Frog.

Angle of 10° 40' or 1 in 5½.	4 feet long.
Angle of 9° 30' or 1 in 6.	4 feet 6 inches long.
Angle of 8° 30' or 1 in 6½.	5 feet long.
Angle of 8° 07' or 1 in 7.	5 feet 3 inches long.
Angle of 7° 23' or 1 in 7½.	5 feet 6 inches long.
Angle of 7° 05' or 1 in 8.	6 feet long.
Angle of 6° 48' or 1 in 8½.	6 feet 3 inches long.
Angle of 6° 19' or 1 in 9.	6 feet 9 inches long.
Angle of 6° 05' or 1 in 9½.	7 feet long.
Angle of 5° 41' or 1 in 10.	7 feet 6 inches long.

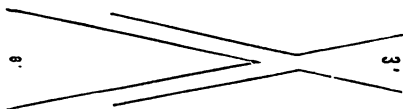


Fig. 589.

Long Frog.

Angle of 19° 04' or 1 in 3.	4 feet long.
Angle of 16° 19' or 1 in 3½.	4 feet 8 inches long.
Angle of 14° 15' or 1 in 4.	5 feet long.
Angle of 12° 40' or 1 in 4½.	5 feet long.
Angle of 11° 23' or 1 in 5.	5 feet long.
Angle of 10° 20' or 1 in 5½.	5 feet 6 inches long.
Angle of 9° 30' or 1 in 6.	6 feet long.
Angle of 8° 45' or 1 in 6½.	6 feet 6 inches long.
Angle of 8° 07' or 1 in 7.	7 feet long.
Angle of 7° 34' or 1 in 7½.	7 feet 6 inches long.
Angle of 7° 05' or 1 in 8.	8 feet long.
Angle of 6° 40' or 1 in 8½.	8 feet 6 inches long.
Angle of 6° 19' or 1 in 9.	9 feet long.
Angle of 6° 00' or 1 in 9½.	9 feet 6 inches long.
Angle of 5° 41' or 1 in 10.	10 feet long.
Angle of 5° 23' or 1 in 10½.	10 feet 6 inches long.
Angle of 5° 10' or 1 in 11.	11 feet long.
Angle of 4° 56' or 1 in 11½.	11 feet 6 inches long.
Angle of 4° 44' or 1 in 12.	12 feet long.

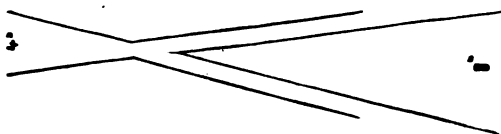


Fig. 590.

EXPLANATION OF SET OF FIXTURES FOR SWITCH.

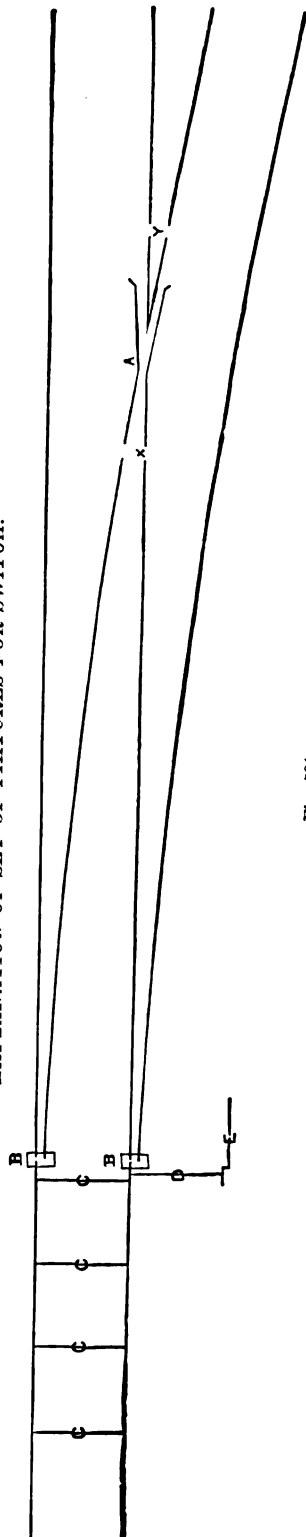


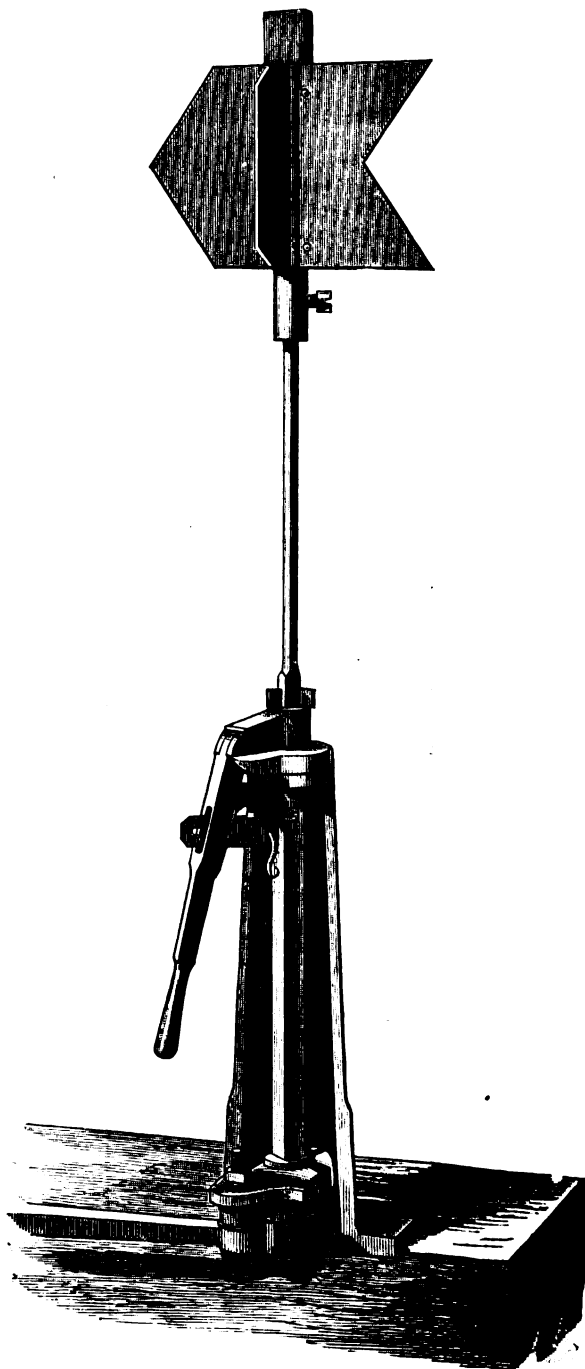
Fig. 591.

A, Frog. Y, Heel of Frog. X, Toe of Frog. B B, Head Blocks. C C C C, Tie bars. D, Connecting Rod. E, Switch Stand.

The length of Frog is determined by the widths of heel and toe as represented by diagram under each table of angles.

BRAHN'S SAFETY SWITCH STAND.

PATTERN "K."



22 CORTLANDT STREET, NEW YORK.

Brahn's Patent Safety Switch Stand.

Pattern "B"

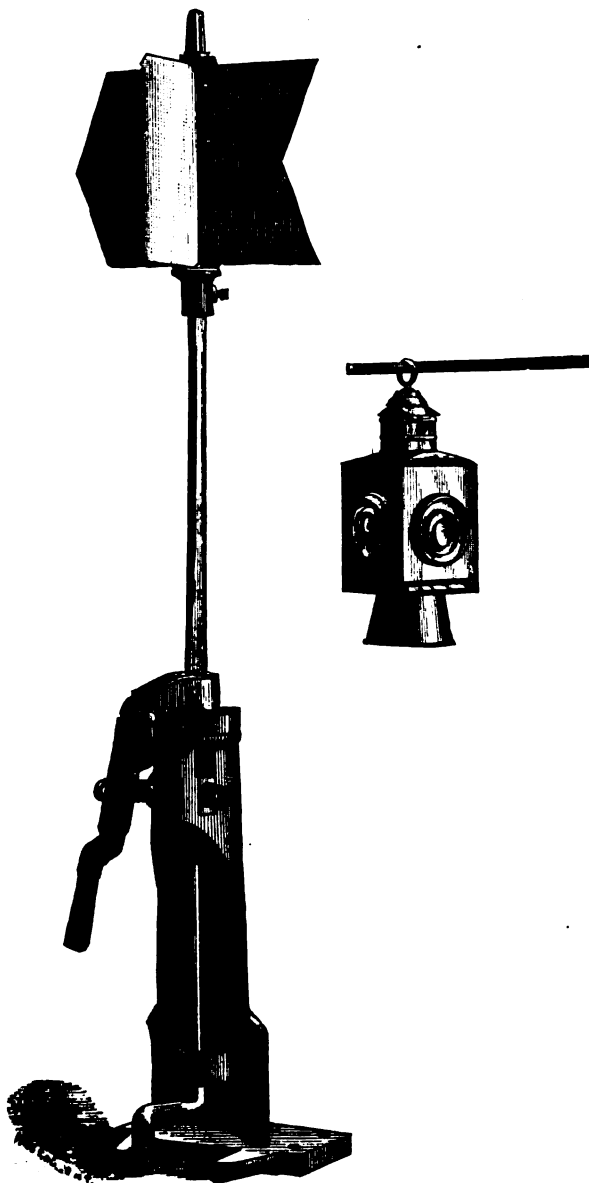


Fig. 593.

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FOR PRICES SEE ACCOMPANYING LIST.

BRAHN'S IMPROVED SWITCH STANDS.

BELL PATTERN.—OUTSIDE VIEW, WITH LAMP.



Fig. 500.

PATTERN "J."

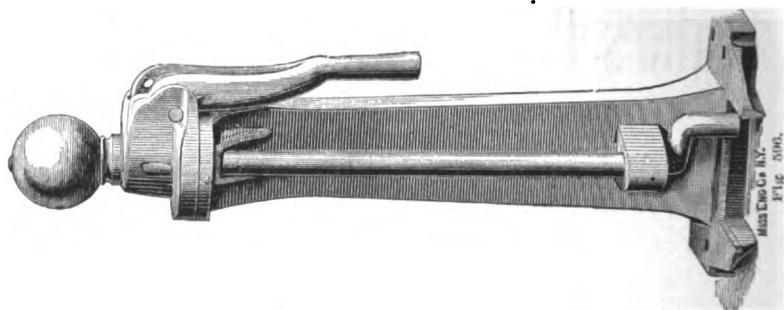


Fig. 501.

BELL PATTERN.

SECTIONAL VIEW OF STAND, WITHOUT LAMP.

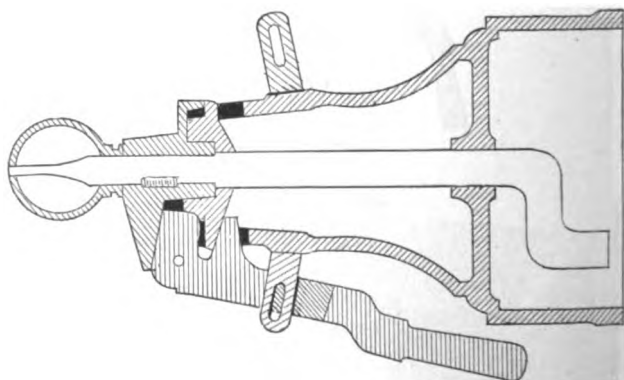
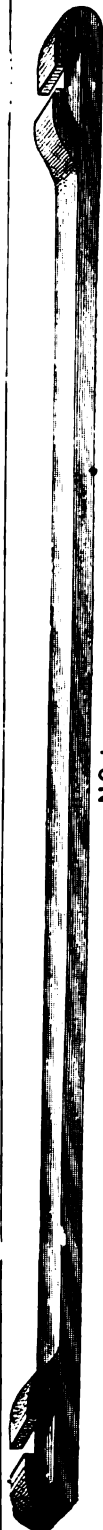


Fig. 504.

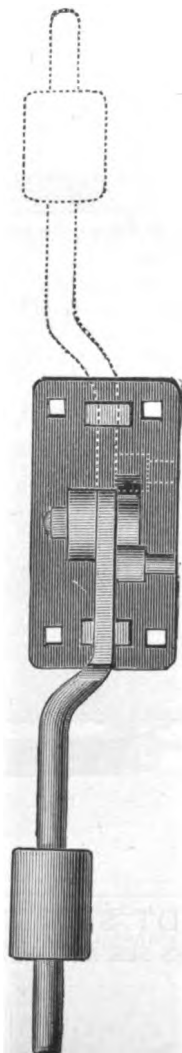
22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.



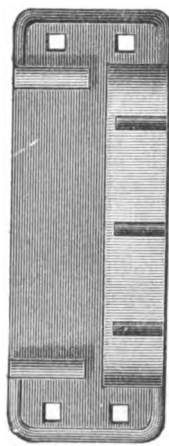
No. 1.



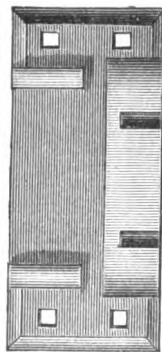
No. 2.



No. 3.



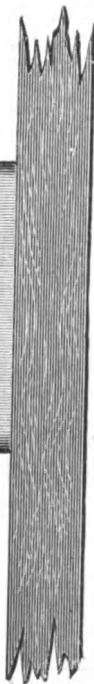
No. 4.



No. 5.



No. 6.



No. 7.

FIXTURES FOR SUB-SWITCH.

CONDICT'S PATENT TIP CAR.

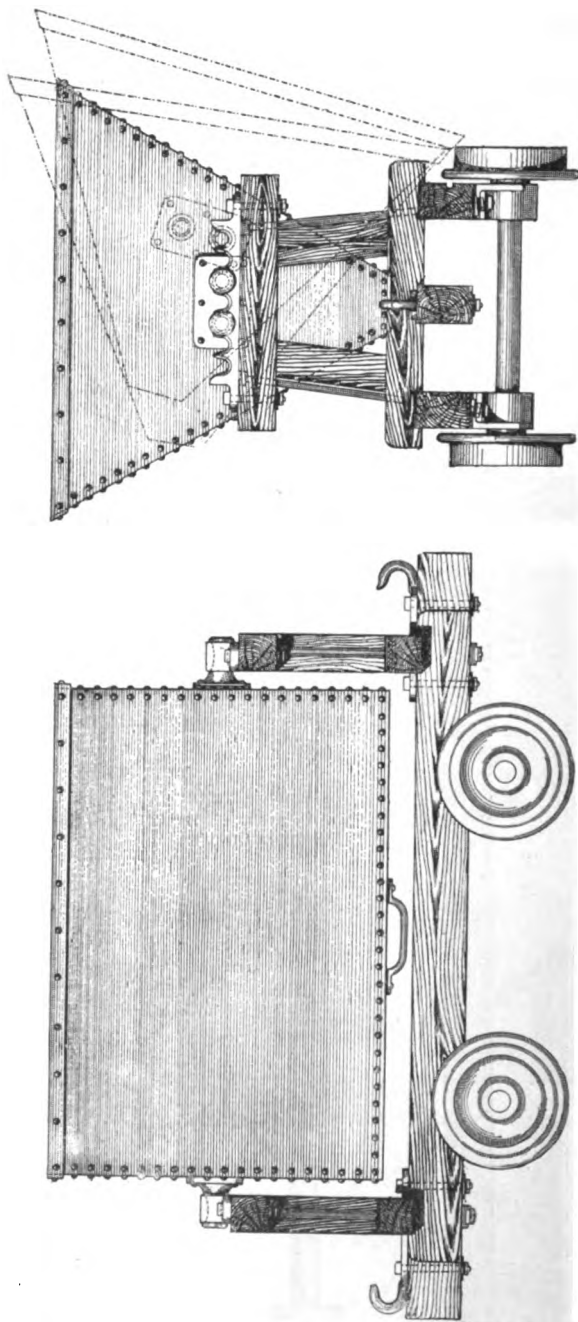


Fig. 598.

Fig. 599.

Sizes and Prices on Application.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

LEVER HAND CAR.

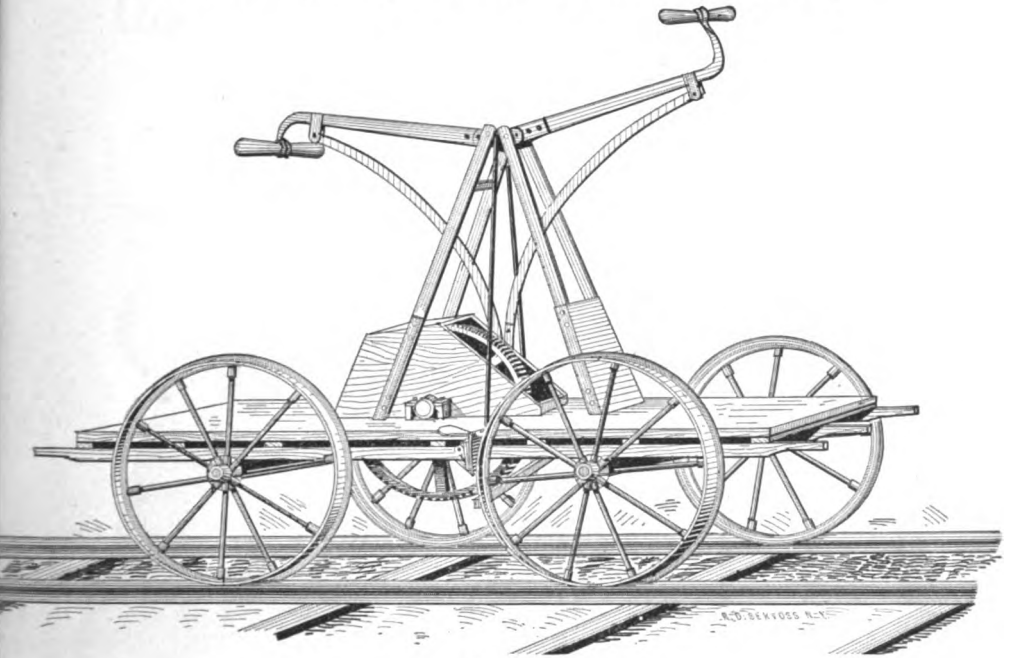


Fig. 600.

Sizes and Prices on Application.

IMPROVED COAL CAR.

FOR USE ON COAL DOCKS AND ELSEWHERE.

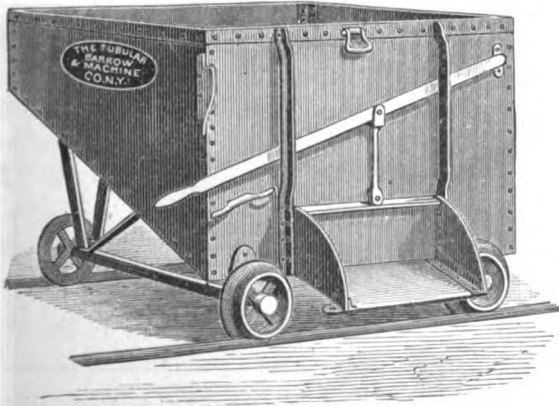


Fig. 601.

Constructed with beveled bottom and a sliding door, made to rise and allow the coal or other substance to slide out and run down a chute or other variety of hopper. These Cars are made with the door at the side or the end, as may be desired. Our Cars are made heavy and strong.

Capacity, $\frac{1}{2}$ Ton Coal.

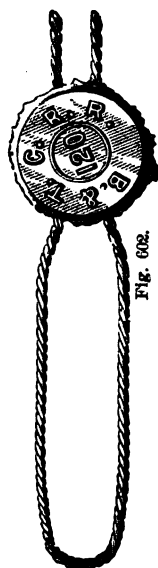
"	1500 lbs.	"
"	1 Ton	"
"	2 "	"

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FOR PRICES SEE ACCOMPANYING LIST.

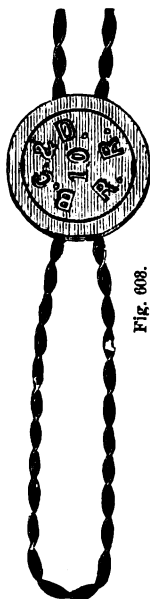
Mear's Lead Seals,

WITH TWISTED, ROUND AND FLAT WIRES.



Twisted Round Wire and Seal.

Fig. 602.



Twisted Flat Wire and Seal.

2, 3 or 6 Ply Wires of any length.

Fig. 603.

Improved Press

FOR SEALING PURPOSES.



Fig. 604.

Conductors' Punch.

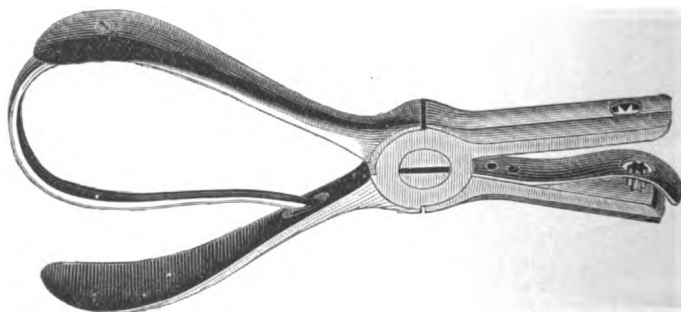


Fig. 605.

Nickel-plated, round or fancy holes. Length of jaws, $1\frac{1}{2}$ and $1\frac{1}{4}$ inches.
Conductors' Common Punches, round or fancy holes.

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FOR PRICES SEE ACCOMPANYING LIST.

HUDSON'S CONDUCTOR'S PUNCH.

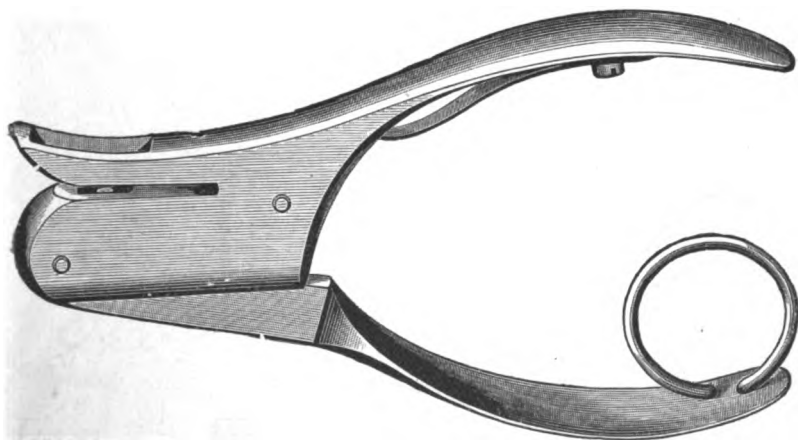


Fig. 606.

PATTERNS.

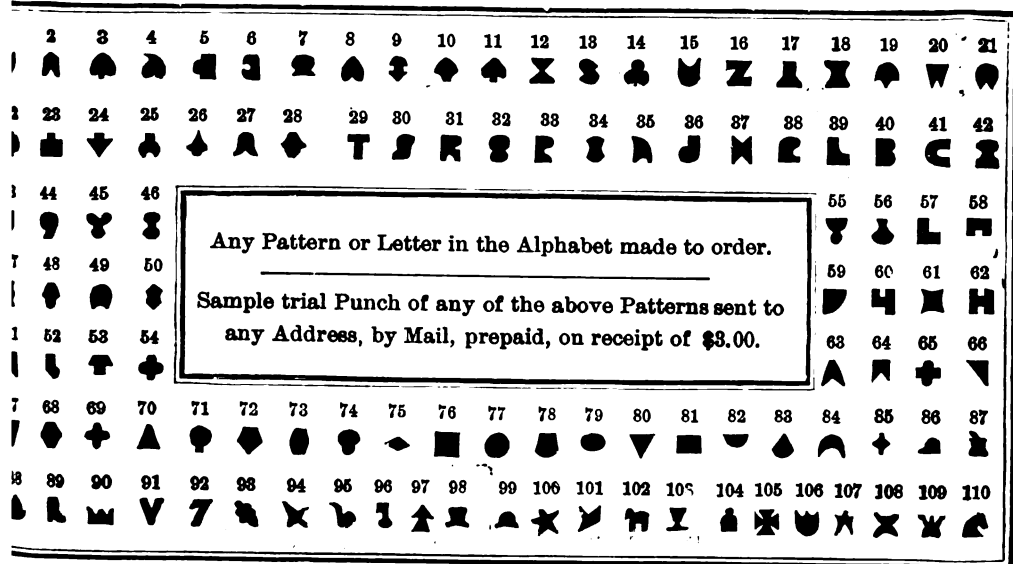


Fig. 607.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

CAR, WINDOW AND SASH TRIMMINGS.

BLIND LIFT, No. 88.

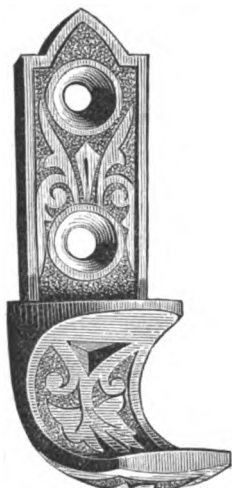


Fig. 608.

UPPER BLIND LIFT, No. 88½.

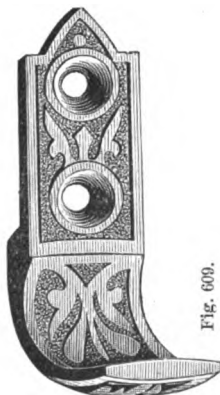


Fig. 609.

SASH LIFT, No. 87.

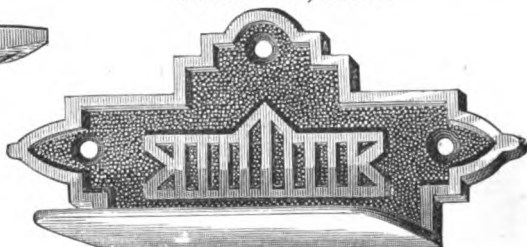


Fig. 611.

SASH OR BLIND LIFT, No. 72.



Fig. 610.

SASH LOCK, No. 138.

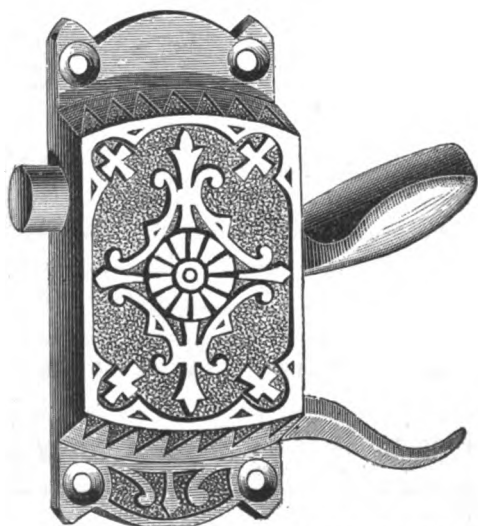


Fig. 612.

SASH LOCK, No. 130.

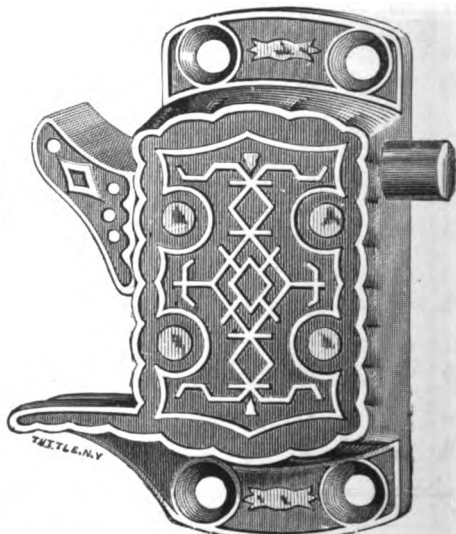


Fig. 613.

EITHER PLAIN OR ORNAMENTAL.

22. CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Locomotive Cab Window Fastenings.

No. 1.



Fig. 614.

No. 2.

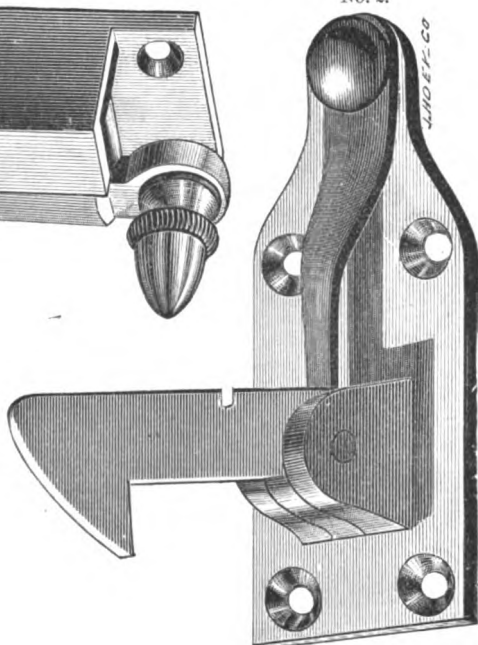


Fig. 616.

Plate for No 1.



Fig. 615.

Sash and Blind Holder.

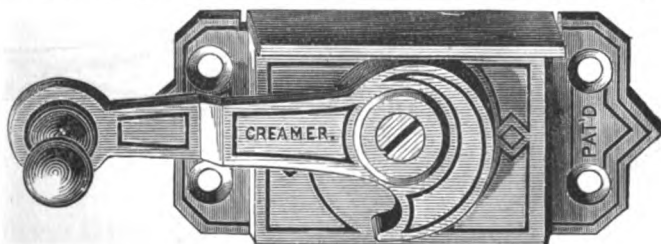


Fig. 617.

DESCRIPTION.

Next to the eccentric is a movable flat plate, parallel to the window post. Turning the lever down presses the plate against the post, holding the sash firmly at any desired point.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

END HOOK. BELL CORD FITTINGS. END RING.



Fig. 620.

PULLEY,
With Plate or Screw.



Fig. 618.

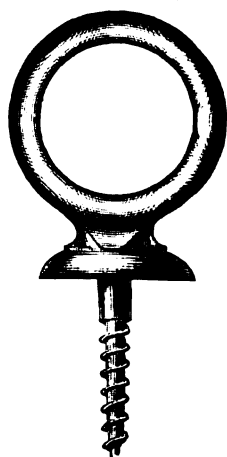


Fig. 621.

COUPLING.

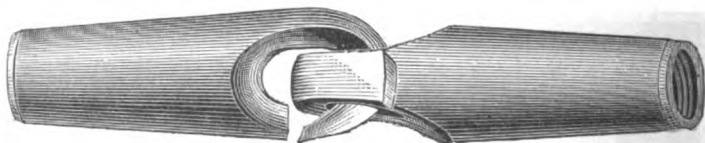


Fig. 622.

DOUBLE AND SINGLE STRAP GUIDES.

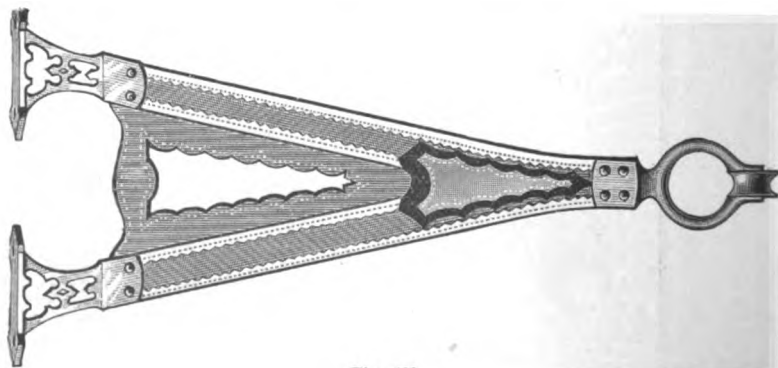


Fig. 623.



Fig. 624.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

GONG BELLS.

LOCOMOTIVE SIGNAL.

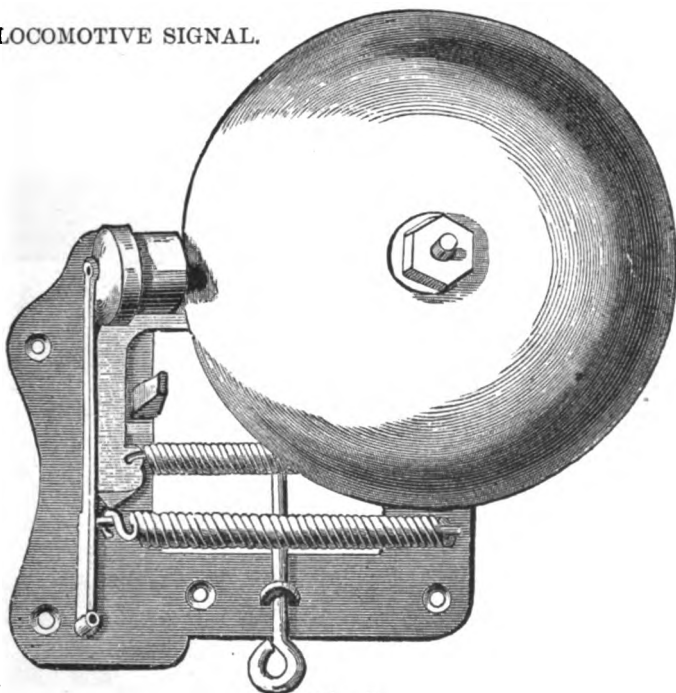


Fig. 625.

Sizes, 6 7 8 9 and 10 inc es.

TRIP GONG.

COMMON GONGS.

Sizes:

8 4 5 6 7 8 9 10 13 15
18 and 25 inches.

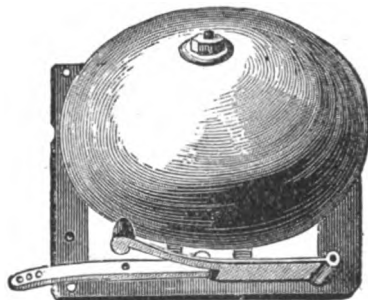


Fig. 626.

Sizes, 13, 15, 18 and 25 inches.

GONG PULL, FOUR SIZES.

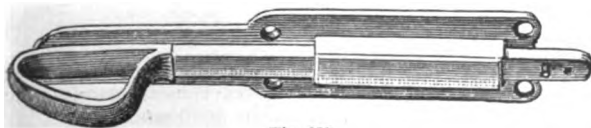


Fig. 627.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

BELLS.

JINGLE BELL.



Fig. 628.

Sizes.....3, 3½, 4, 4½, 5, 6 inch.

IMPROVED STEEL-AMALGAM BELLS.



FERDINAND.
Fig. 631.

BELL CRANK.—SIDE.

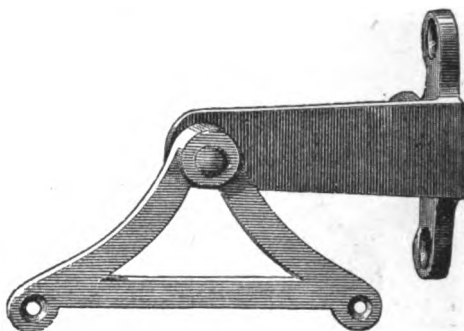


Fig. 629.

Three Sizes.

BELL CRANK.—END.

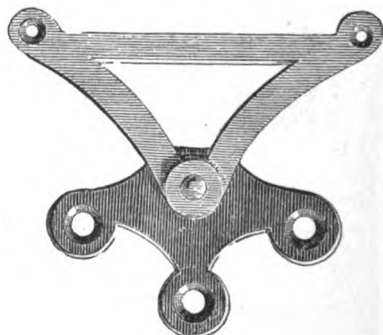


Fig. 630.

Three Sizes.

DIMENSION OF BELLS.

No.	Fig. 631.	
	Diameter.	Weight.
1.	18 inches.	44 lbs.
2.	15 "	52 "
3.	15½ "	63 "
4.	16½ "	79 "
5.	17 "	89 "
6.	19½ "	125 "
7.	21½ "	181 "

These bells are especially adapted to farms, plantations, school houses, factories, etc. They combine the valuable qualities of tone, strength and durability of vibration.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.



Fig. 632.

THE "ECLIPSE" RAIL-ROAD BAR.

For moving cars on sidings and switches.

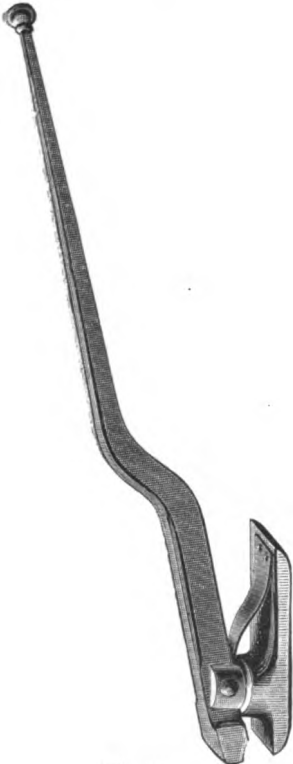


Fig. 633.

STEEL-AMALGAM BELLS,

With Hangings and Frame complete.

SIZES.

No. 7.	Diam.,	30 in.	Weight,	260 lbs.
" 8.	"	34 "	"	418 "
" 9.	"	38 "	"	528 "
" 10.	"	42 "	"	980 "

Tolling attachments furnished, if desired, at an extra cost.

RAILROAD DEPOT SCALES.

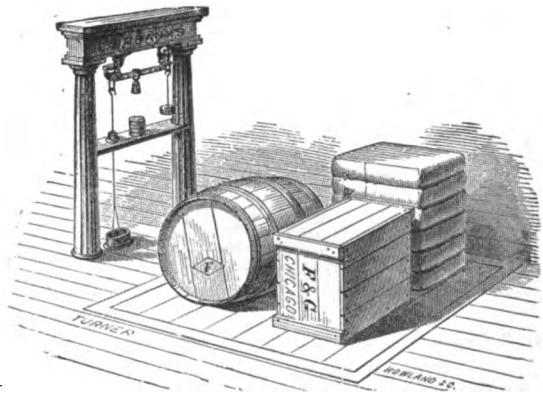


Fig. 634.

No. 1.	Capacity,	6 tons,	platform,	9 x 10 feet
" 2.	"	4 "	"	7 x 9 "
" 3.	"	"	"	5 x 6 "
" 4.	"	2 "	"	4½ x 7½ "

The prices for the above are exclusive of timber and foundation, which are to be furnished at purchaser's expense.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

SCALES.

PORTABLE PLATFORM SCALE, WITH OR WITHOUT WHEELS. **PORTABLE PLATFORM SCALE, WITH HEAVY WHEELS AND DROP LEVER.**

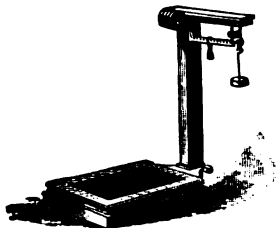


Fig. 635.
SIZES.

Number.	Capacity.	Platform.
7.....	2,000 pounds.	23 x 30 inches.
8.....	1,600 "	23 x 30 "
9.....	1,400 "	21 x 28 "
10.....	1,200 "	20 x 28 "
10½.....	900 "	17 x 26 "
11.....	600 "	16 x 25 "
11½.....	400 "	15 x 21 "

FOUNDRY SCALE,

Extra heavy, with 12 in. wheel and drop lever.



Fig. 637.

No. 2, Capacity, 3,000 lbs. Platform, 30x39 in.

PIG IRON SCALE,

With wheels and drop lever. Very heavy.



Fig. 639.

Capacity, 2,500 lbs. Platform, 23 x 37 in.
" 3,000 " " 23 x 37 "



Fig. 636.

SIZES.

No..... 7, 8, 9, 10, 10½.
Capacity..2,500, 2,000, 1,500, 1,200, 1,000 lbs.
Platform..23x30, 23x30, 21x28, 20x28, 17x26 in.

ROLLING MILL SCALE, RUBBER SPRING PLATFORM.

Fig. 638.

Capacities.	Platforms.
2,500 lbs.	23 x 30 in.
4,000, 6,000 lbs. }	30 x 39 in.
8,000, 10,000 lbs. }	

METAL SCALE,

WITH WHEELS AND DROP LEVER.



Fig. 640.

Capacity, 2,500 lbs. Platform, 22 x 35 in.
" 1,500 " " 21 x 28 "
" 1,200 " " 20 x 28 "

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

**FURNACE STOCK CHARGING SCALE
WITH IMPROVED PATENT BEAM.**

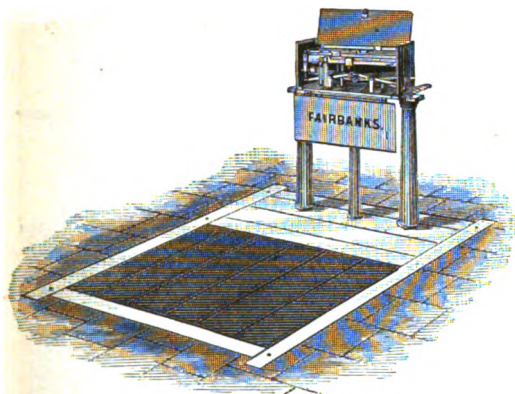


Fig. 641.

SIZES :

No.	Beams.	Levers.	Connections.
1	4	6 ft. 8 in.	2 ft. 8 in.
	4	5 " 4 "	1 " 9 "
2	5	6 " 8 "	2 " 8 "
	5	5 " 4 "	1 " 9 "
3	6	6 " 8 "	2 " 3 "
	6	5 " 4 "	1 " 9 "
4	8	6 " 8 "	2 " 3 "
	8	5 " 4 "	1 " 9 "

The prices do not include the timber which is provided by the purchaser at his expense. We frame the scales at our expense, the same as coal and other scales of that character.

PORTABLE COTTON SCALE

DORMANT PLATFORM COTTON SCALES.

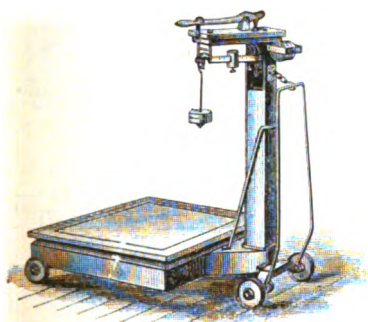


Fig. 642.

Capacity, 1,000 lbs. Platform, 36x47 in.

NEW IMPROVED PACKAGE BALANCE
Adopted by U. S. Government.

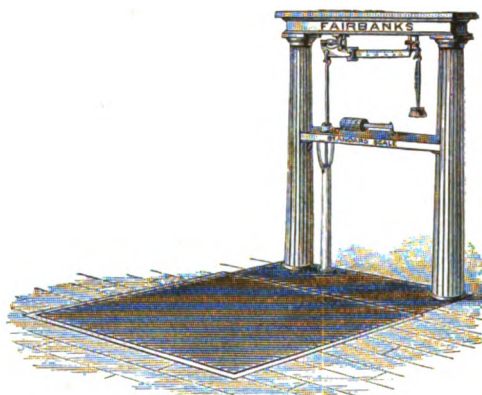


Fig. 643.

Capacity, 1,500 lbs. Platform, 48x54 in. Single Pillar,

" 1,500 lbs. " 48x54 in. 2 Iron "

Extra for Double Beams.

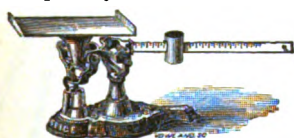


Fig. 644.

Capacity $\frac{1}{2}$ oz. to 4 lbs.

COUNTER SCALE.

IMPROVED LETTER BALANCE.
Adapted by U. S. Government.

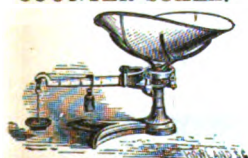


Fig. 645.

Capacity, $\frac{1}{2}$ oz. to 36 lbs.



Fig. 646.

Capacity, $\frac{1}{2}$ oz. to 8, 12 & 34 oz.

UNION SCALE.



Fig. 647.

Capacity, $\frac{1}{2}$ oz. to 240 lbs.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

COOKE & CO. S C A L E S

COAL DEALERS' SCALES.

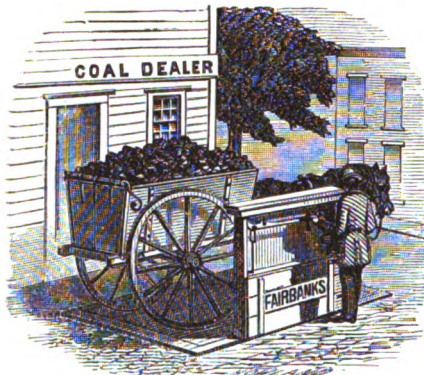


Fig. 648.

Capacity.	Size of Platform.	Distance from edge of Platform to Beam Rod.
3 tons.	14x7 ft. 2 1/2 in.	1 foot 11 1/2 inches.
4 "	14x7 " 2 1/2 "	1 " 11 1/2 "

The prices are exclusive of the cost of timber and foundation, which is to be paid by purchaser.

RAILROAD TRACK SCALES.

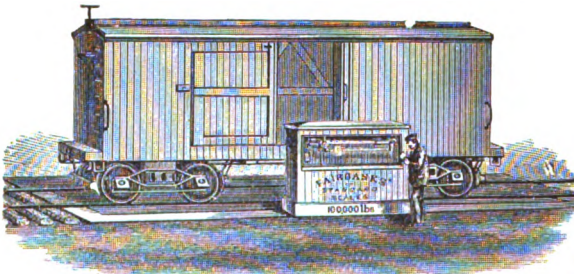
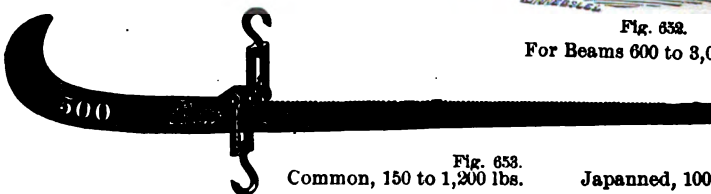


Fig. 649.

Sizes.	
Capacity, 150	150 150 75 65 50 50 tons.
Platform, 130	123 112 84 61 42 34 feet.
Capacity, 40	30 40 30 40 30 25 25 20 tons.
Platform, 34	34 34 32 32 30 30 26 24 20 feet.

PATENT BALANCES.

Fig. 653.
Common, 150 to 1,200 lbs.

SPRING BALANCES.

Round.

Locomotive.

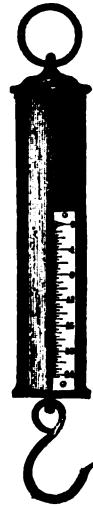
Fig. 650.
24 lbs.

Fig. 651.

50	75	80	84 lbs.
96	100	150	200 lbs.

FRAMES FOR WEIGHMASTERS' BEAMS.

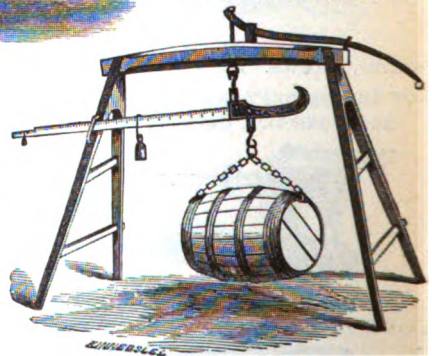


Fig. 652.

For Beams 600 to 3,000 lbs.

Japanned, 100 to 3,000 lbs.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

HYDRAULIC JACKS.

GROUND LIFTING JACK.

BASE JACK.

PLAIN JACK.

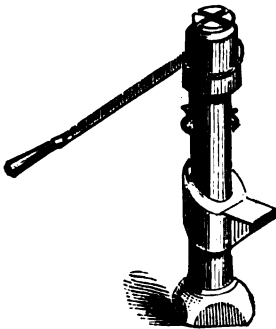


Fig. 654.

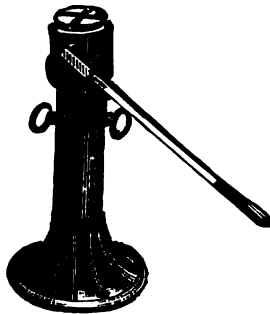


Fig. 655.

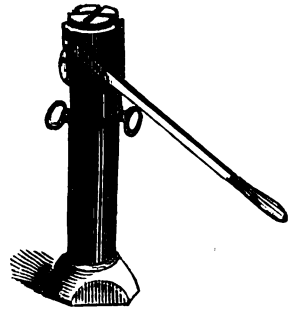


Fig. 656.

Number.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Height of lift, in.....	12	24	12	18	24	12	18	12	18	12	9	12	9	12	9	12	12	9
Capacity in tons.....	4	4	7	7	7	10	10	15	15	20	30	30	60	60	90	90	100	120

BELL BOTTOM JACK SCREWS.

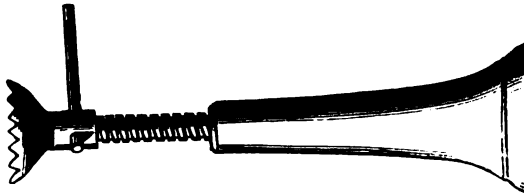


Fig. 657.
SIZES.

DIAMETER OF SCREW.

1 1/2 inches.
1 1/4 " "
1 1/2 " "
2 " "
2 1/4 " "
2 3/4 " "
3 " "

LENGTH OF SCREW.

6, 8 inches.
6, 8, 10, 12 " "
6, 8, 10, 12, 14, 16 " "
6, 8, 10, 12, 14, 16, 18, 20, 24 " "
8, 10, 12, 14, 16, 18, 20, 24 " "
8, 10, 12, 14, 16, 18, 20, 24 " "
20 " "

BALL'S TELESCOPE JACKS.

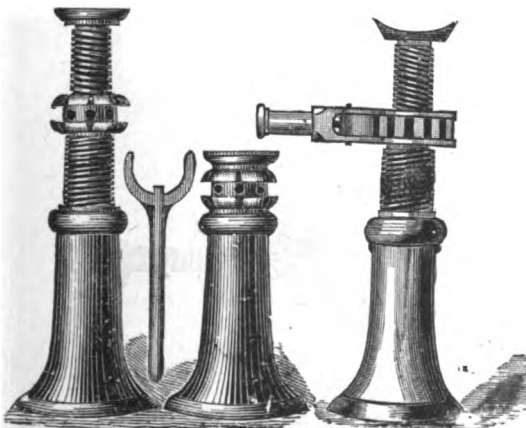


Fig. 658.

Fig. 659.

Fig. 660.

SIZES.

No. 1.	Length of Screw.....	14 in.
" 2.	"	20 "
" 3.	"	27 "
" 4.	"	35 "
" 5.	"	40 "

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FOR PRICES SEE ACCOMPANYING LIST.

RATCHET SCREW JACK.



Fig. 661.

Number..... 1, 2, 3, 4.
 Size of screw, in.. $2\frac{1}{4}$ x18, $2\frac{1}{2}$ x24, $2\frac{3}{4}$ x30, $2\frac{7}{8}$ x36.

LIFTING AND CARRYING RATCHET JACK.

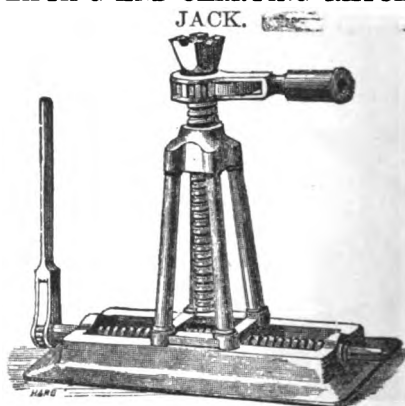


Fig. 662.

SIZE.

Vertical screw..... $2\frac{1}{4}$ x36 in.
 Horizontal screw..... $1\frac{1}{2}$ x12 "

IRON JACK FOR REPAIRING TRACK.

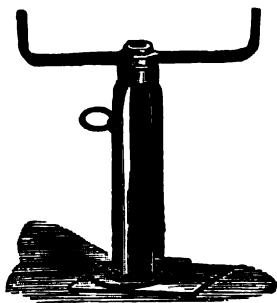


Fig. 663.

BUILDERS' CAST IRON JACK SCREW.

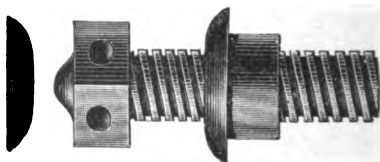


Fig. 664.

Size..... $8\frac{1}{2}$ x12 inches.

CLAW JACK.

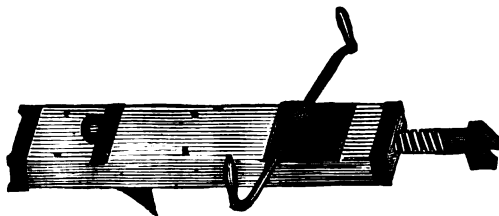


Fig. 665.

Number..... 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
 Diam. of screws..... 2, 2, 2, 2, $2\frac{1}{4}$, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{1}{2}$, $2\frac{3}{4}$, $2\frac{3}{4}$ inches.
 Length of screws..... 24, 30, 33, 36, 39, 36, 42, 36, 42, 48 "

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HORIZONTAL JACKS.

WITH OR WITHOUT GROUND LIFTING CLAW.

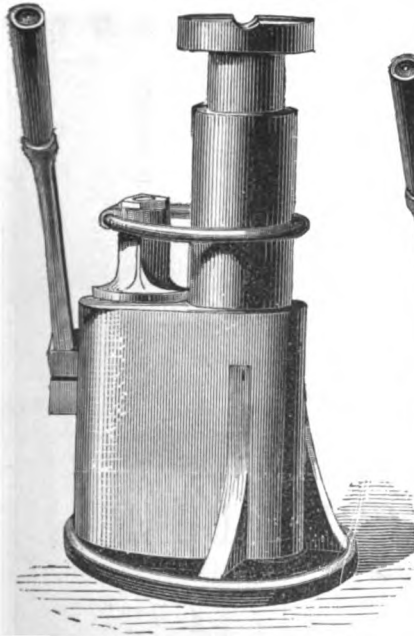


Fig. 666.

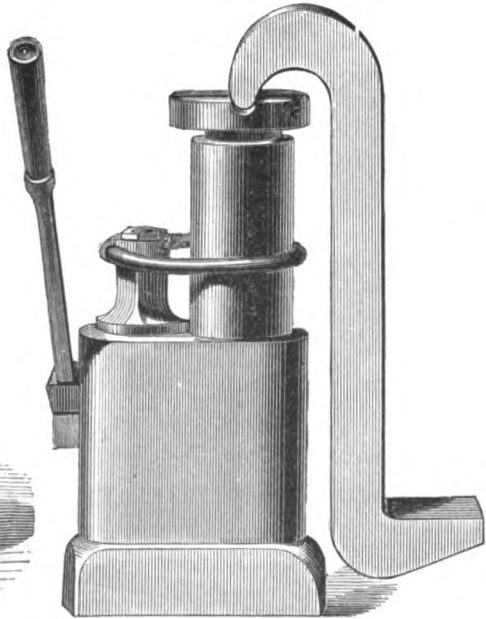


Fig. 667.

Sizes and Prices same as Figs. 654-656.

HYDRAULIC PUNCH

STEEL SCREW PUNCH.

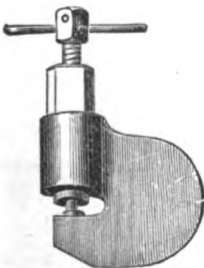


Fig. 668.

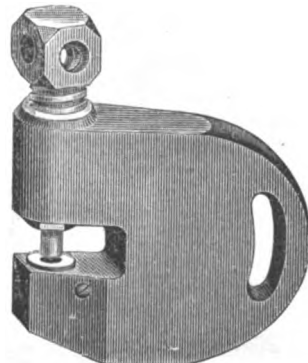


Fig. 669.

SIZES:		
No.	Diameter of Hole.	Thickness of Plate.
1.....	$\frac{1}{4}$ inch.....	$\frac{1}{4}$ inch.
2.....	$\frac{1}{2}$ ".....	$\frac{1}{2}$ "
3.....	$\frac{3}{4}$ ".....	$\frac{3}{4}$ "
4.....	1 ".....	1 "
5.....	$1\frac{1}{4}$ ".....	$1\frac{1}{4}$ "
6.....	$1\frac{1}{2}$ ".....	$1\frac{1}{2}$ "

SIZES:		
No.	Diameter of Hole.	Thickness of Iron.
1.....	$\frac{1}{4}$ inch.....	$\frac{1}{4}$ inch.
2.....	$\frac{1}{2}$ ".....	$\frac{1}{2}$ "
3.....	$\frac{3}{4}$ ".....	$\frac{3}{4}$ "

221 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE "DUPLEX" SCREW PUNCH.

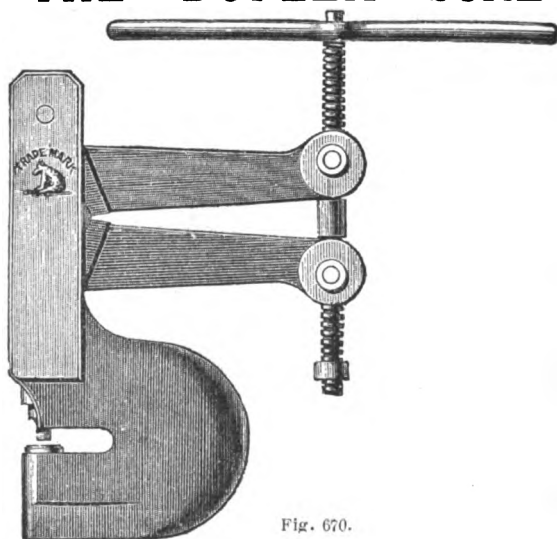


Fig. 670.

SIZES:

No.	Diam. of Hole.	Thickness of Plate.	Weight.
1	$\frac{1}{4}$ inch.	$\frac{1}{4}$, $1\frac{1}{2}$ in. from edge.	25 lbs.
2	$\frac{1}{2}$ "	$\frac{1}{4}$, $1\frac{1}{2}$ "	42 "
3	$\frac{3}{4}$ "	$\frac{1}{4}$, 2 "	80 "

HYDRAULIC PUNCHING BEAR.

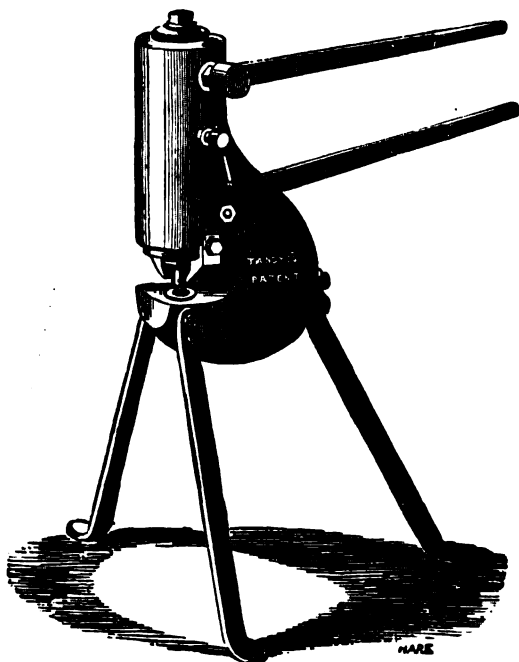


Fig. 671.

SIZES:

No.	Diam. of Hole.	Thickness of Plate.	Weight.
1	$\frac{1}{4}$ inch.	$\frac{1}{4}$, $1\frac{1}{2}$ in. from edge.	64 lbs.
2	1 "	$\frac{1}{4}$, $1\frac{1}{2}$ "	120 "
3	$1\frac{1}{2}$ "	$\frac{1}{4}$, $1\frac{1}{2}$ "	320 "
4	1 "	Steel Rails.	

Extra Depth of Gap to order.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HYDRAULIC PUNCHES FOR RAILS.

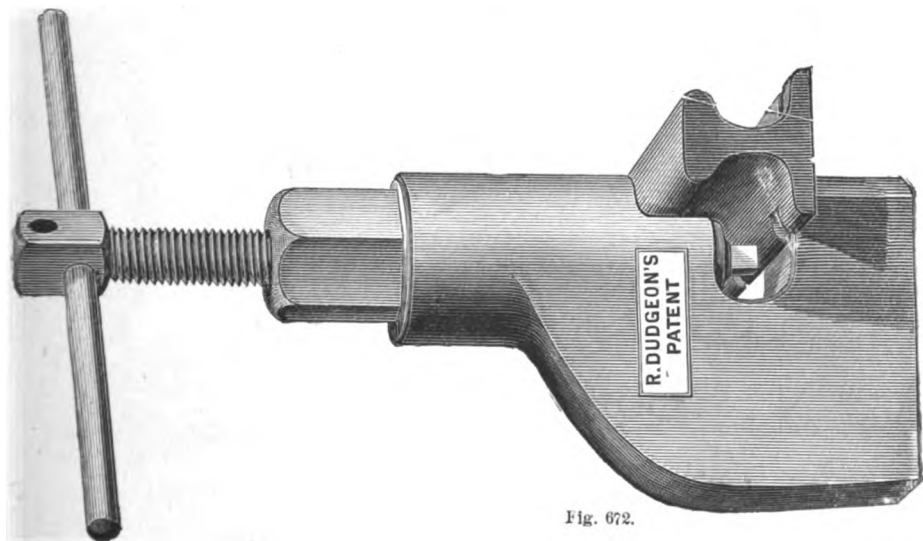


Fig. 672.

To Punch hole for Spike.

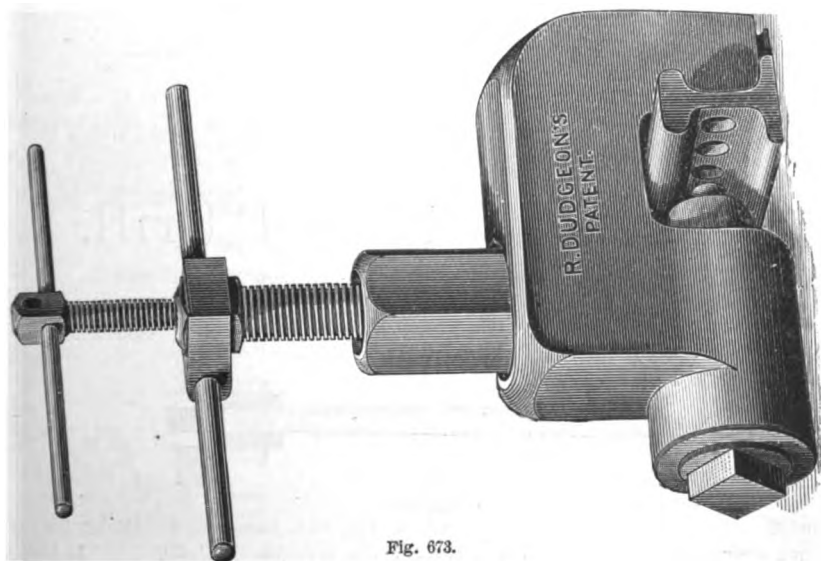


Fig. 673.

To Punch hole for Fish Plate, before or after laying the Rails.

In ordering please send a piece of rail as sample, that the Punch may be made to fit.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Packer Ratchet.

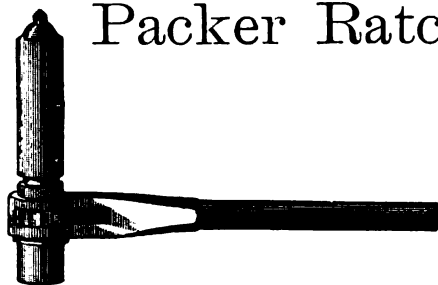


Fig. 674.

Number..... 1, 2, 3, 4, 5.
 Length of Handle..... 10, 12, 15, 17, 20 inches.

Boiler Ratchet.

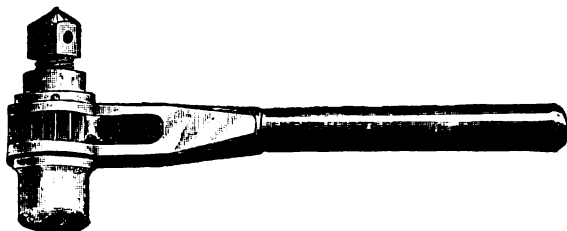


Fig. 675.

Number..... 1, 2.
 Length of Handle..... 10, 12 inches.

Excelsior Ratchet Drill.

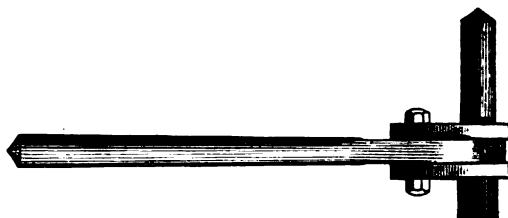


Fig. 676.

Number..... 1, 2, 3. Boiler pattern.
 Length over all..... 12, 16, 20, 12 inches.

22 CORTLANDT STREET, NEW YORK.
 FOR PRICES SEE ACCOMPANYING LIST.

Weston's Improved Differential Ratchet Drills.

WROUGHT IRON HANDLES.

CLASS A.

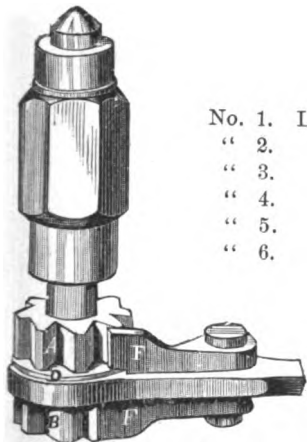


Fig. 677.

SIZES.

No. 1.	Length, 12 inches.
" 2.	" 14 "
" 3.	" 16 "
" 4.	" 18 "
" 5.	" 20 "
" 6.	" 22 "

CLASS B.

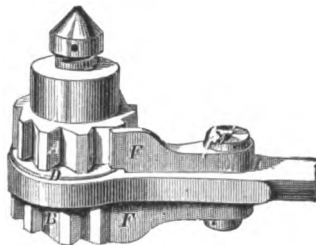


Fig. 678.

Length, 14 inches.

CLASS C.

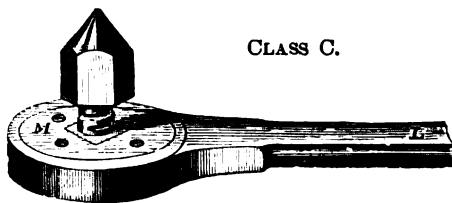


Fig. 679.

Length, 14 inches.

CLASS E.

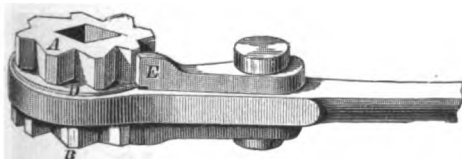


Fig. 680.

Length, 18 inches.

CLASS F.

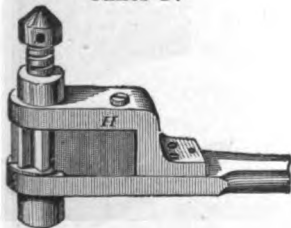


Fig. 681.

Length, 12 inches.

CLASS D.

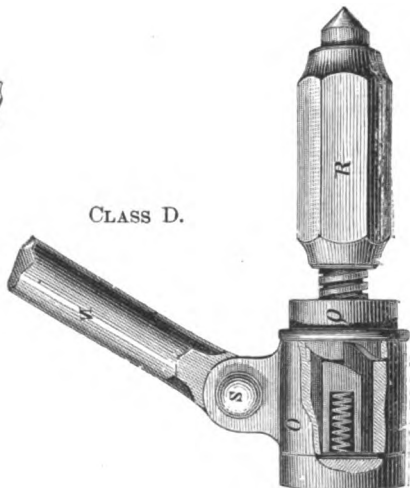


Fig. 682.

Length, 12 inches.

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FOR PRICES SEE ACCOMPANYING LIST.

CAR SPRINGS.

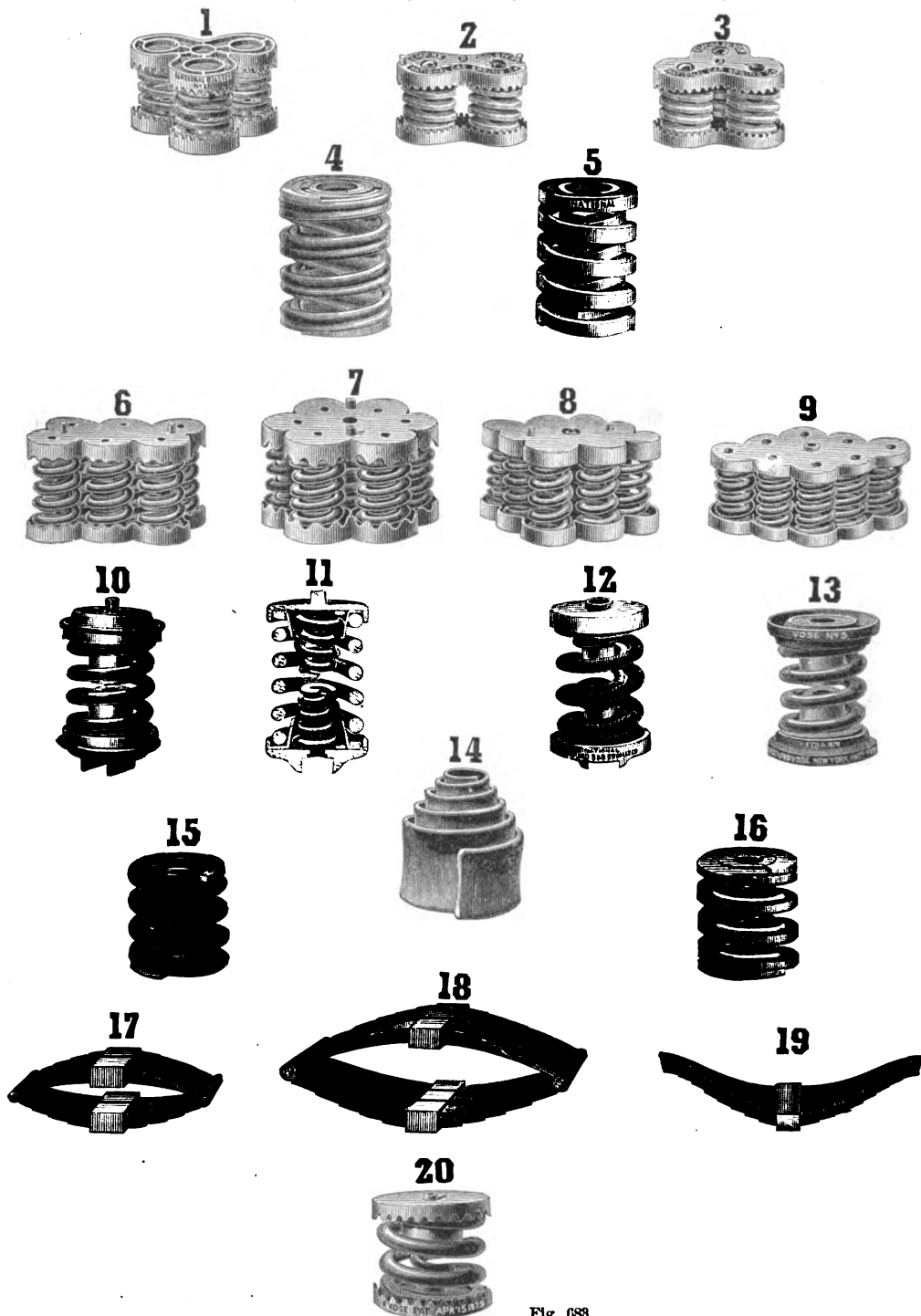


Fig. 688.

BLACKSMITHS' TOOLS—Best Cast Steel.

TOP SWAGE.

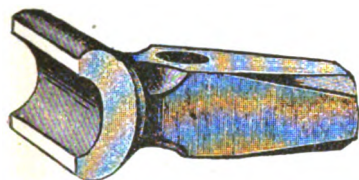


Fig. 684

BOTTOM SWAGE.



Fig. 685

SQUARE FLATTER.

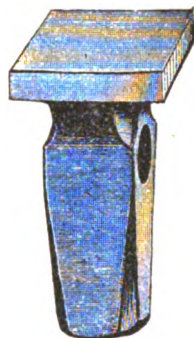


Fig. 686.

TOP FULLER.

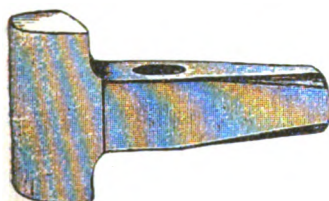


Fig. 687.

BOTTOM FULLER.

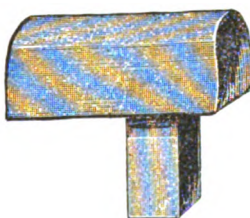


Fig. 688.

ROUND FLATTER.



Fig. 691.

SET HAMMER.

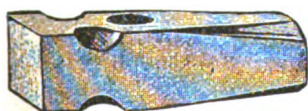


Fig. 689.

HARDY.

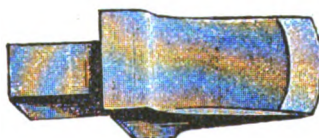


Fig. 690.

CUPPING TOOLS.

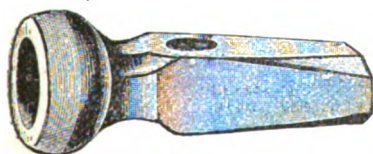


Fig. 692.

PUNCH.

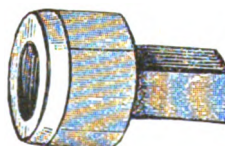


Fig. 693.

COUNTERSINK.



Fig. 695.



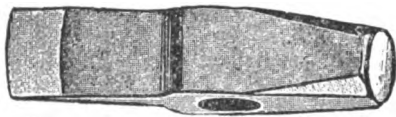
Fig. 694.

Punches, round and square, $\frac{1}{4}$ to 2 inches.

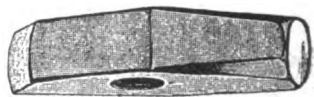
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FOR PRICES SEE ACCOMPANYING LIST.

BLACKSMITHS' TOOLS—BEST CAST STEEL. (Continued.)



HOT CHISEL. Fig. 696.
COLD CHISEL.



CREASER. Fig. 698.
HEADING TOOL.

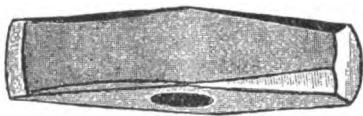


Fig. 697.

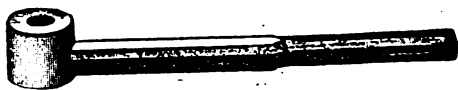


Fig. 699.

Heading Tools, round and square, $\frac{1}{4}$ to 2 inches.

BLACKSMITHS' TONGS.

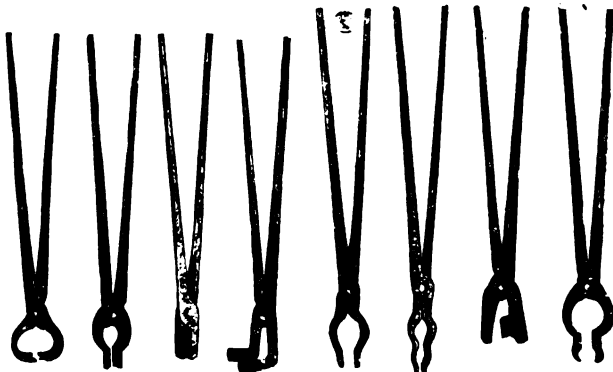


Fig. 700. Fig. 701. Fig. 702. Fig. 703. Fig. 704. Fig. 705. Fig. 706. Fig. 707.

MACHINISTS' HAMMERS.—BEST CAST STEEL.

BALL PENE.

STRAIGHT PENE.

CROSS PENE.

ENGINEERS'.

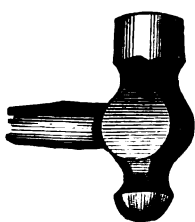


Fig. 708.

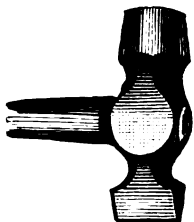


Fig. 709.

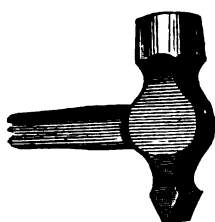


Fig. 710.

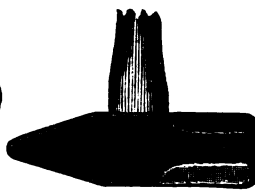


Fig. 711.

Nos.	0000	000	00	0	1	2	3	4	5	6	7	8
Weight.	8 oz.	12 oz.	1 lb.	1½	1½	1½	2½	2½	2½	3	3½	3½ lbs.
ENGINEERS'—Fig. 711. }				Nos.	0	1	2	3	4	5		
				Weight,	1½	2	2½	3½	4	5 lbs.		



Fig. 712.

BOILER-MAKERS'
HAMMERS.



Fig. 713.

2 to 3 lbs. each.

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FOR PRICES SEE ACCOMPANYING LIST.

**SMITHS' SLEDGE
STRAIGHT OR CROSS PENE.**

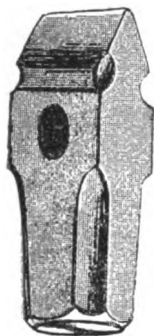


Fig. 714.

6 to 30 lbs.

**STRIKING
HAMMER.
BEST CAST STEEL.**

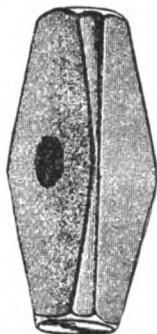


Fig. 715.

6 to 30 lbs.

**SMITHS' HAND
HAMMER.**

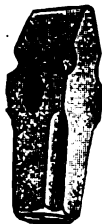


Fig. 716.

2 to 5 lbs.

SWAGE BLOCKS.

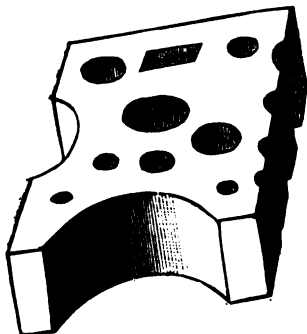


Fig. 717.

Weight about 175 lbs.

SWAGE BLOCK, WITH STAND.

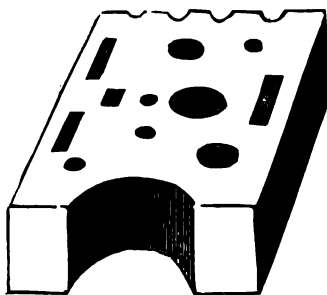


Fig. 718.

Weight about 280 lbs.

RAILROAD SPIKE MAULS.—BEST CAST STEEL.

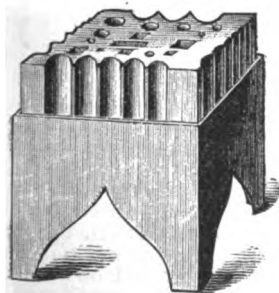


Fig. 719.

Weight about 300 lbs.

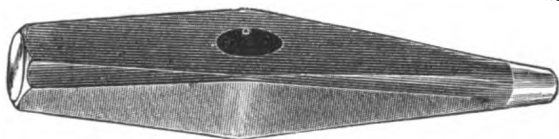


Fig. 720.

Weight 6 to 9 lbs.

SHIP OR TOP MAULS.—BEST CAST STEEL.

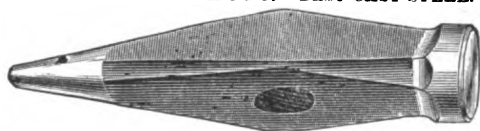


Fig. 721.

Weight 5 to 8 lbs.

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FOR PRICES SEE ACCOMPANYING LIST.

SOLID WROUGHT IRON ANVILS.

40 Lbs. and Heavier.

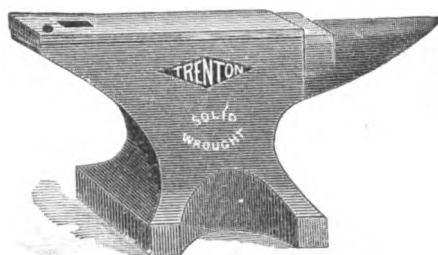


FIG. 722.

PETER WRIGHT'S PATTERN.

THE PATENT "EAGLE" ANVILS.

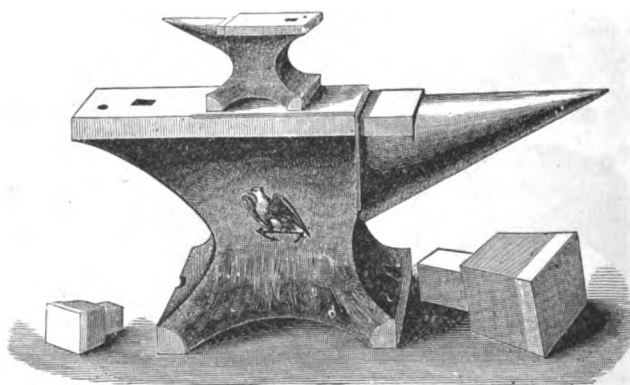


Fig. 723.

Sizes,	000	00	0	1	2	3	4	5	6	7	8	9
Weight,	$\frac{1}{2}$	4	10	15	20	30	40	50	60	70	80	90 lbs.

Larger Sizes from 100 to 800 lbs.

These Tools are fully warranted. The "Peter Wright," and all anvils (except the EAGLE,) are made with a body and horn of fibrous wrought iron, and only for the face steel plates are welded on. This soft iron gradually settles, carrying the face with it, and the Anvil becomes hollowed on the face. Shear steel, also, is used, but it can never be made to take good temper like cast steel. The EAGLE ANVIL body is made of gun metal—crystallized iron—which neither settles nor breaks, and not only the face, but the horn, also, is of the Best Tool Cast Steel, welded on so perfectly by the process of its original and only inventor, the late MR. MARK FISHER, that it is warranted never to come off. The face planed to a true surface, is made so hard that the hammer makes no impression on it, and it always remains so. The steel horn is tough and unhardened, and will not break or bend.

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FOR PRICES SEE ACCOMPANYING LIST.

Roots' Rotary Hand Blower, FOR BLACKSMITHS' FIRES.

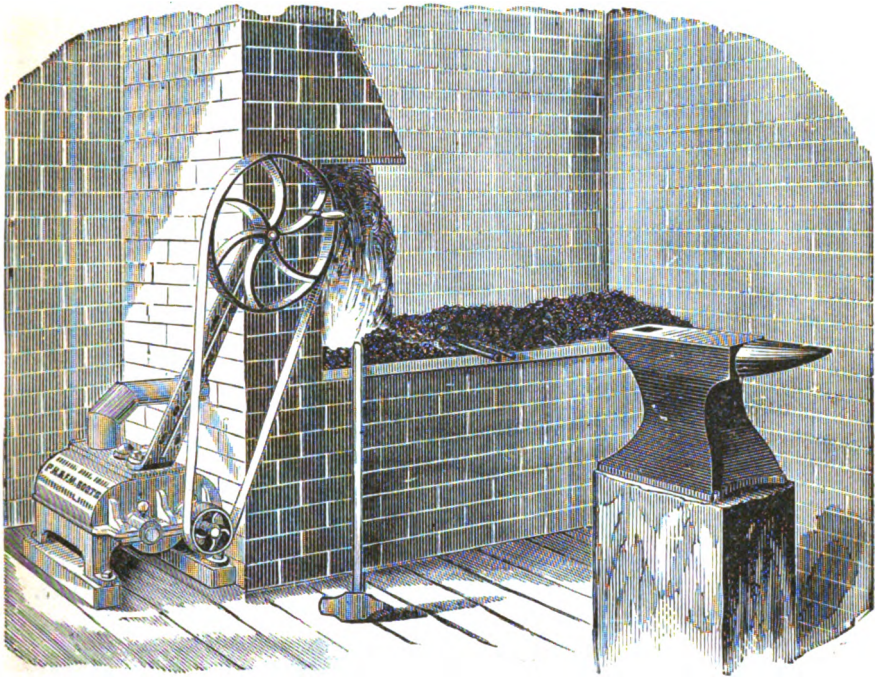


Fig. 724.

We invite the special attention of Blacksmiths to the advantages of our little HAND BLOWER for smiths' shops.

Its great durability—being made of iron. Economy of room—only occupying about 18 inches square. Producing a force blast that can be varied instantly from the slightest breath to the strongest blast. Great saving of coal. More work can be done with the blower than with the bellows. Operated more easily and pleasantly than the bellows; can be run by hand or power, and connected with any Tuyere.

No. $\frac{1}{2}$ Blower, Model size, for light, mechanical purposes; discharges 52 cubic inches of air each revolution.

No. $\frac{1}{4}$ Blacksmith Hand Blower, discharges $\frac{1}{4}$ cubic foot of air each revolution.

No. $\frac{1}{2}$ Blacksmith Hand Blower, will furnish ample blast for one ordinary fire, by hand or by power; gives $\frac{1}{2}$ cubic foot of air each revolution.

No. 1 Blacksmith Hand Blower will furnish ample blast for a large fire by hand, or two by power; gives $\frac{1}{2}$ cubic foot of air each revolution.

No. 2 Blacksmith Hand Blower will furnish ample blast for one largest class fire by hand, or three by power; gives $\frac{1}{2}$ cubic foot of air each revolution.

Names of parties using the Blacksmith Blower can be seen at our office.

To Operate—Set the Blower perfectly level, on a solid foundation; see that all the feet touch before screwing down; pipe with metal pipe full as large as the opening in the Blower, with round turns or elbows, entering the Tuyere as large as possible; see that it is tight; turn slow. 20 to 50 revolutions per minute of upper wheel; too much blast is as objectionable as too little; oil with good oil in the holes made for oiling, only; to clean the journals use a few drops of naphtha or benzine in place of oil.

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FOR PRICES SEE ACCOMPANYING LIST.

ROOTS' ROTARY BLOWER

OPERATED BY HAND LEVER.

Sizes and Prices same as Fig. 724.

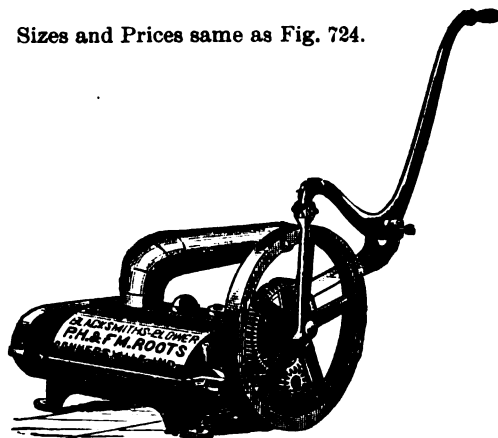


Fig. 725.

Roots' Patent Fire Bed and Tuyere.

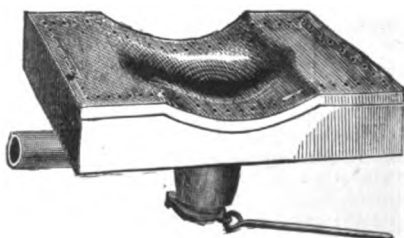


Fig. 726.

DIRECTIONS FOR SETTING TUYERE.

The forge should be constructed with inside cross walls, 17 inches apart in the clear ; the space underneath the Fire bed and Tuyere should be left entirely open, to allow the free circulation of air.

SIZES :

- No. 1. Adapted to small Forges.
- No. 2. Adapted to Gunsmiths' Forges.
- No. 3. Adapted to ordinary Smiths' Shops, Carriage Shops and general Smithies.
- No. 4. Adapted to Machine Shops and heavy Forges.

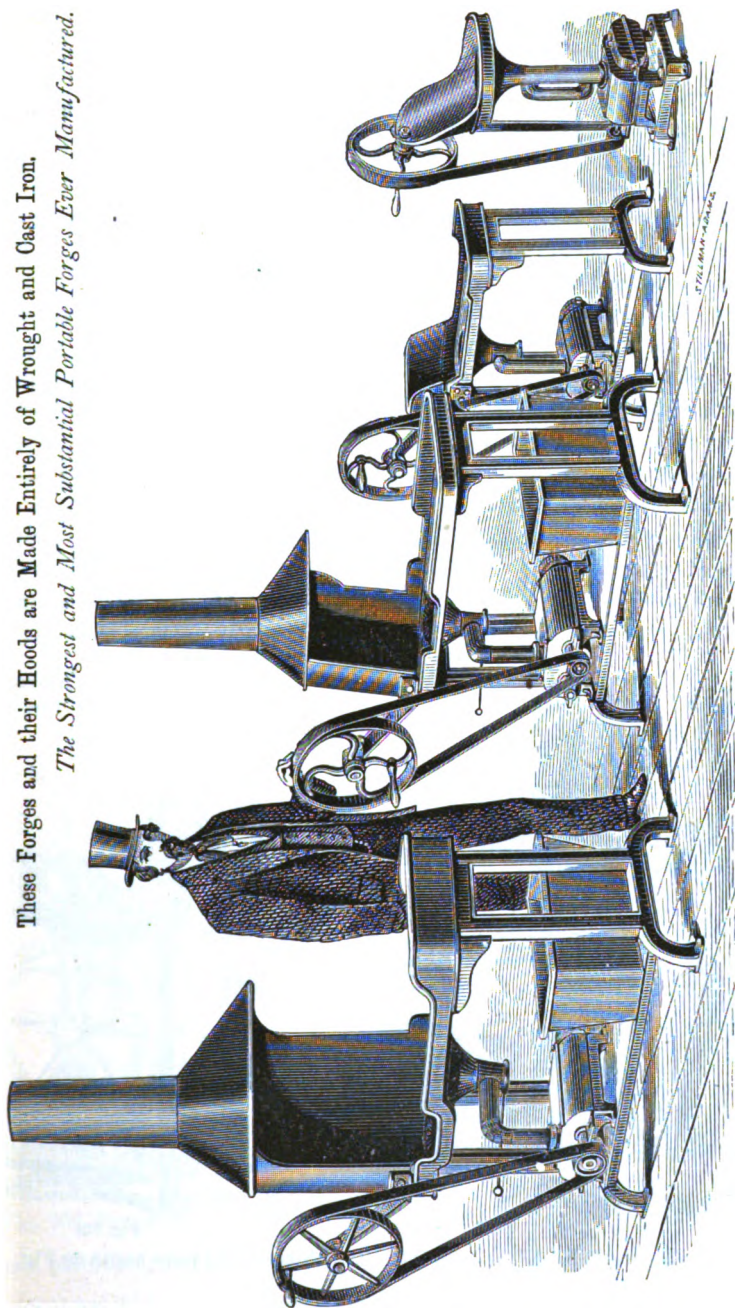
22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

ROOTS' IMPROVED PORTABLE FORGES.

These Forges and their Hoods are Made Entirely of Wrought and Cast Iron.

The Strongest and Most Substantial Portable Forges Ever Manufactured.



- No. 5.** Hearth 36 by 60 in. Blast equal to 50 in. Bellows.
- No. 4.** Hearth 36 by 42 in. Blast equal to 40 in. Bellows.
- No. 3.** Hearth 20 by 30 in. Blast equal to 36 in. Bellows.
- No. 2.** Hearth 14 by 20 in. Blast equal to 30 in. Bellows.
- No. 1.** Hearth 14 by 20 in. (oval.) Blast equal to 24 in. Bellows.

Fig. 727.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST

ROOT'S IMPROVED PORTABLE FORGE.

Hitherto, in making Forges portable, the bellows have been so diminished, and the blast so reduced, as to be of little value for practical purposes. The blast to our Forge is produced by our ROTARY HAND BLOWER (can be run by hand, or power), in combination with our improved Tuyere, and makes the most complete forge in use, not only for such purposes as portable forges are generally used, but they have all the conveniences and working capacity for smithing, from the lightest to the heaviest, and yet occupy less than one-third the room of the common brick forge with the leather bellows attached; and a workman with our Forge can turn off one-fourth more work than with the old style forge and bellows. They can be placed just where wanted, ready for use, thus saving the expense of brick, mortar, mason work, tuyere and bellows. When easy locomotion is desired they are mounted on wheels.

Operate slow; 30 to 50 strokes of lever or turns of upper wheel per minute; everybody operates too fast; too much blast is as objectionable as too little.



Fig. 728.

FORGES ON WHEELS, EXTRA.
Size No. 1 not made with wheels.

No. 1 size (either movement),
especially designed for bridge
building.

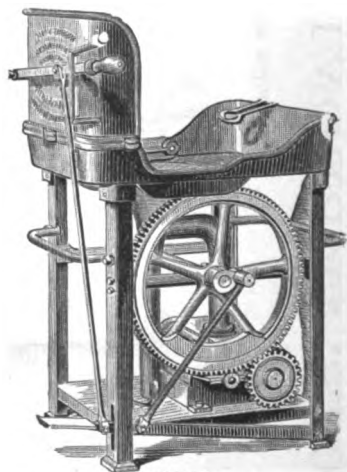


Fig. 729.

Sizes and prices same as Fig. 727.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

WATSON'S PORTABLE FORGE.

It is made of the best material, with steel shafts which run in brass bushings, like the Forge Blower. This Forge differs from any other in the construction of the machinery which drives the fan. It consists of a gear-wheel and pinion to drive the counter-shaft, from which a belt, one inch wide, runs on a pulley to the pulley on the fan. It will drive the fan when slack, which cannot be done on Forges where a round belt is used. No cinders or dirt can fall into the bearings. The crane containing all the machinery can be swung under the center of the Forge, thus preventing breakage while being transported. We warrant this Forge superior in every respect to any other in the market. Fig. 731 Forge is the same as Fig. 730, except in size.

No. 1.—WITH HOOD.



Fig. 730.

No. 1.—WITHOUT HOOD.

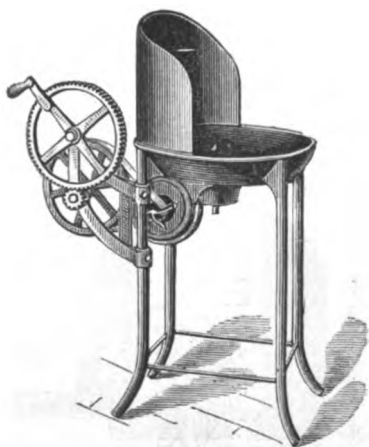


Fig. 731.

Fig. 730 Forge is adapted for the use of farmers, jewelers, gunsmiths, boiler-makers, plumbers, and all other purposes for which Forges are used.

This Forge is warranted to give perfect satisfaction in every case.

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FOR PRICES SEE ACCOMPANYING LIST.

WATSON'S FORGES.

No. 2 Forge the same as No. 1, except it is larger.

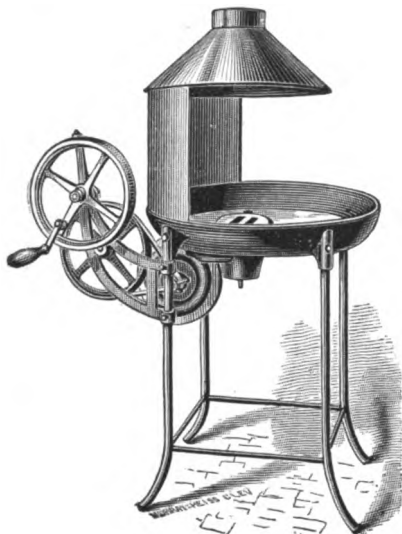


Fig. 732.

SIZES.

No.	Height. in.	Diam. of Hearth. in.	Diam. of Fan. in.	Weight. lbs.
1	30	20	7½	83
2	30	24	8½	105
4	28	30 x 40	11½	165

No. 4.—This size is large enough for any common blacksmithing. Gives as strong a blast as any bellows that cost \$40.00. It is portable, and, as will be seen, occupies but little room.

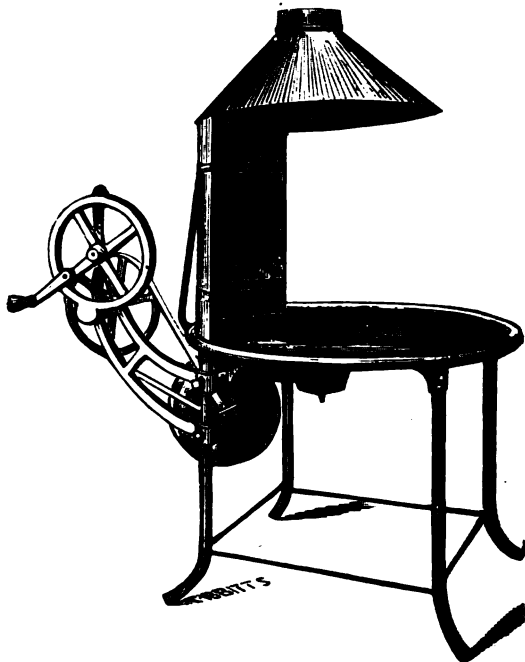


Fig. 733.

WATSON'S FORGE BLOWER.

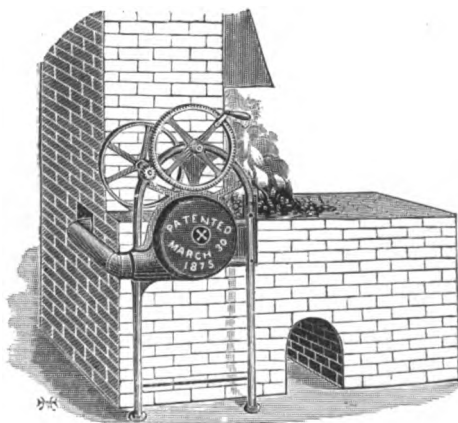


Fig. 734.

This cut represents the Blower set up ready for use. It is made of the best material, with steel shafts and brass boxes. The boxes are so arranged that they can be removed by simply loosening a set screw, and replaced in a moment's time. The superiority of this Blower can be readily seen.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

THE EMPIRE PORTABLE FORGES.

FOR BRIDGE, BOILER AND RAILROAD WORK.

FOR BLACKSMITHS AND CARRIAGE MAKERS.

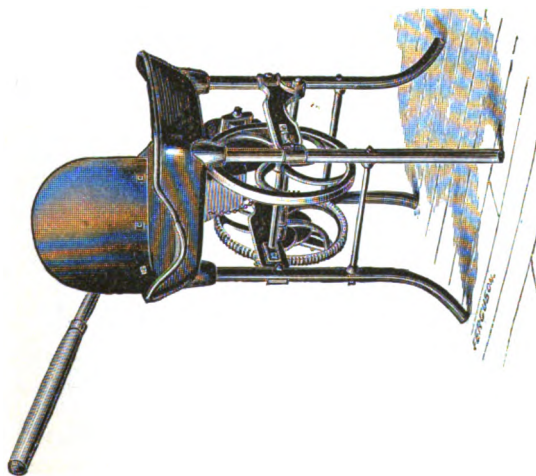


Fig. 735.

No. 10. With or without Hood. Pipe Legs. Swivel Handle.

Fire Pan 17x19 in. Height 29 in. Fan 8 in. Weight 90 lbs.

No. 9. With or without Hood. Pipe Legs. Swivel Handle.

Fire Pan 21x27 in. and 5½ in. deep. 10 in. Fan. Height 29 in. Weight 150 lbs.

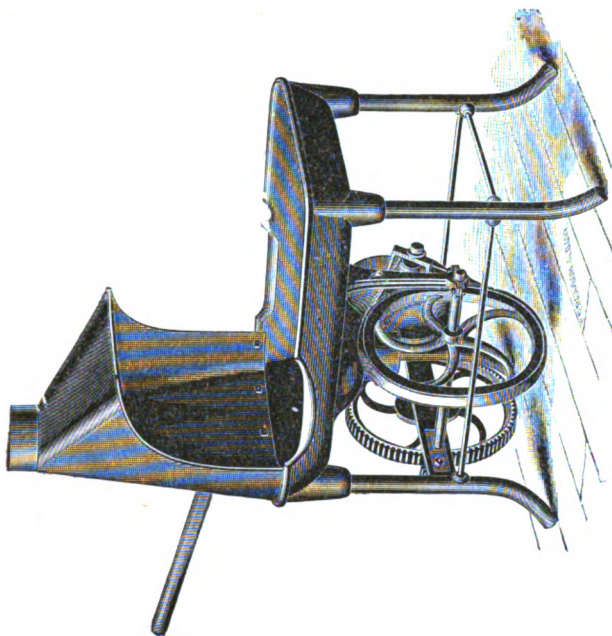


Fig. 736.

No. 7. With Half Hood. Pipe Legs. Swivel Handle.

Height of Fire Pan 25 in. Size 28 x 40 in. Fan 14 in. Weight 250 lbs. For either hand or power.

No. 74. Stationary Blast Forge. Same as the above, without the Hood, Fan or Gearing, to be attached to a Power Blower. A "Canopy" is usually hung over it. Weight 150 lbs.

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FOR PRICES SEE ACCOMPANYING LIST.



Fig. 730

For Machine Shops, Blacksmith Shops and Jewelers' Use.

For Bridge, Boiler and Railroad Work.

No. 8.—RIVET-HEATING FORGE.

10 inch fan, 19 inch diameter, 3 feet high. 200 lbs. weight, with lever and handles; back legs on wheels.

Forges Figs. 737-738 are made of cast iron and are heavy. They are intended for shop work, to be placed like a lathe and not to be moved about. The hoods are also cast iron, and close up as tightly as a stove, and just as safe from fire.

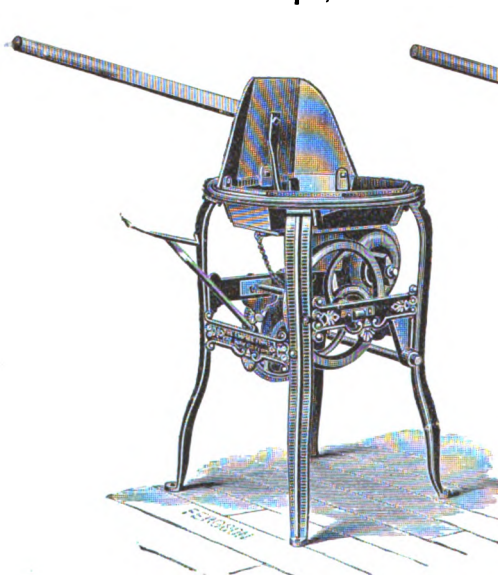


Fig. 737.

WITHOUT HOODS.

No.	Fan.	Diam.	Height.	Weight.
1	8 in.	2-1	3-6	140 lbs.
2	10 in.	2-3	3-9	230 lbs.

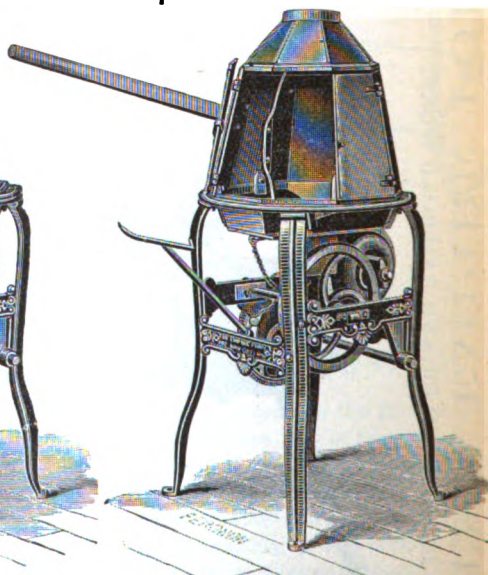


Fig. 738.

WITH HOODS.

No.	Fan.	Diam.	Height.	Weight.
0	8 in.	1-10	3-10	160 lbs.
1	8 in.	2-1	4-0	170 lbs.
2	10 in.	2-3	4-3	270 lbs.
3	10 in.	2-7	4-6	285 lbs.

Nos. 2 and 3 also made for power.

22 CORTLANDT STREET, NEW YORK.

Empire Portable Forges,

FOR ALL LIGHT WORK ON FARMS, SHOPS AND MILLS.

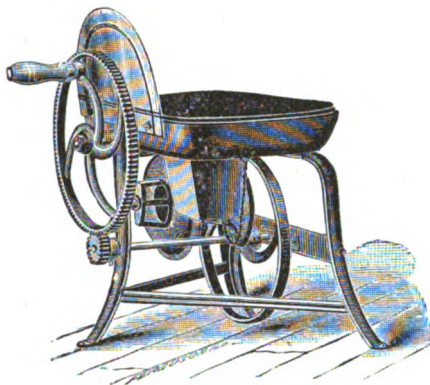


Fig. 740.

No. 12.—WITHOUT HOOD.

FAN.	SIZE.	HEIGHT.	WEIGHT.
7 in.....	12x17.....	15 in.....	50 lbs.

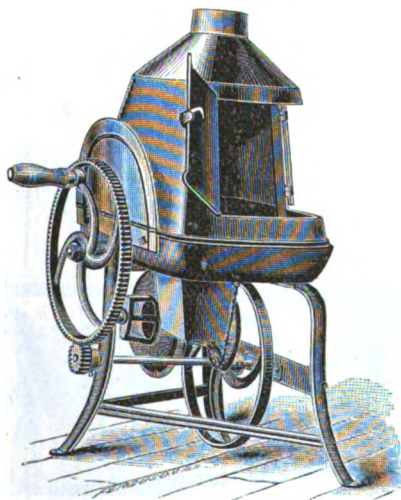


Fig. 741.

No. 12.—WITH HOOD.

FAN.	SIZE.	HEIGHT.	WEIGHT.
7 in.....	12x17.....	28 in.....	70 lbs.

These Forges are sold largely to Farmers, and we supply them with the Blacksmiths' Tools necessary to enable them to make their own repairs.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE WESTERN PORTABLE FORGE.

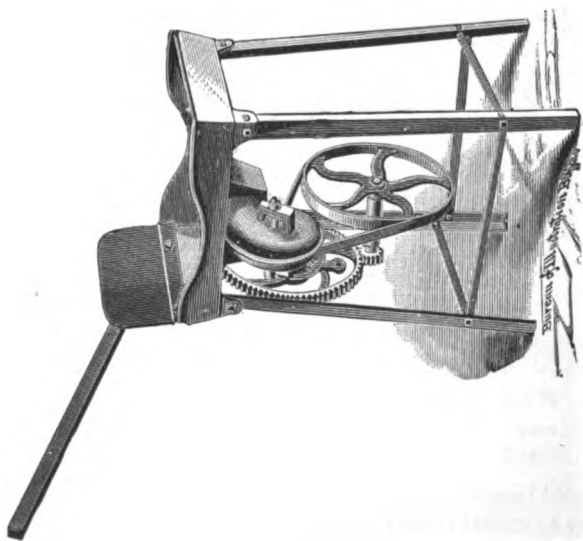


Fig. 742.

WITHOUT HOODS.

No.	Fan.	Size.	Height.	Weight
20.	7 inch.	15x19	33 inch.	95 lbs.

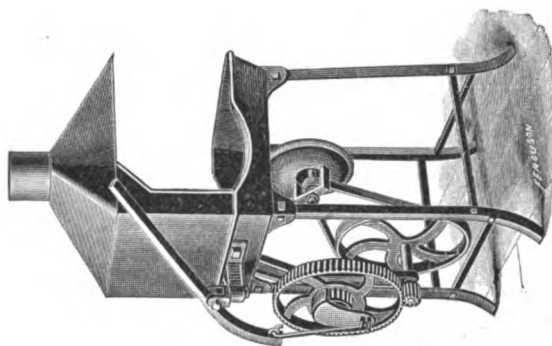


Fig. 743.

WITH HOODS.

No.	Fan.	Size.	Height.	Weight.
21	7 inch.	15x19	55 inch.	115 lbs.

N. B.—These Forges are designed to meet the wants of those who require a light, cheap, belt forge, and are made, after eight years experience and study, of the wants of metal workers, to be equal to any fan blowing forge made by other parties.

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THE "WESTERN" HAND BLOWER.**DESCRIPTION.**

1st. It has a wrought iron frame of angle iron, riveted together, so that it is perfectly rigid, and is not affected by fire or the weather.

2d. The wind blast capacity is fully equal to the smith's large bellows, and is sufficient for two fires, and is as easily worked, having a swiveled handle.

3d. The bearings are babbitted, and when worn out can be easily repaired.

4th. The main gear wheel is put in motion by the common dogs and ratchet, fully exposed to sight, and can be replaced by any ordinary blacksmith, a device much simpler and stronger than a complicated enclosed pawl and ratchet clutch.

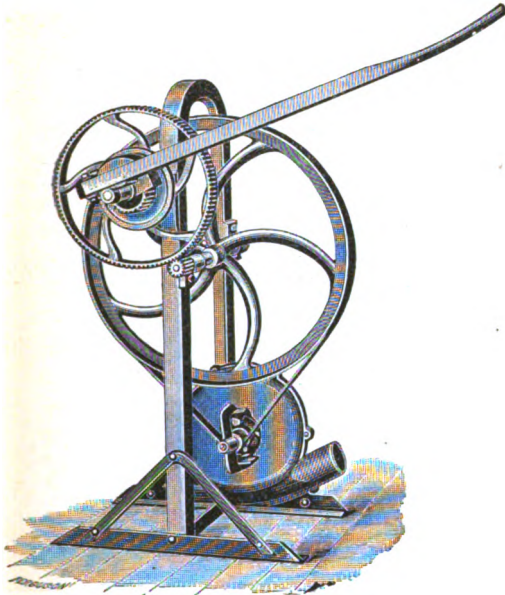


Fig. 744.

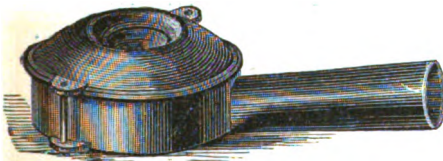
DUCK-NEST TUYERE.

Fig. 745.

EMPIRE ADJUSTABLE TUYERE.

Fig. 746.

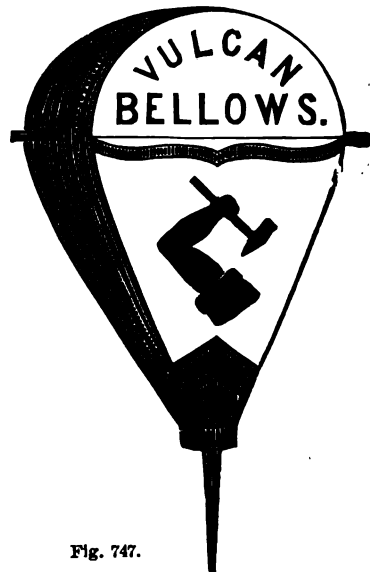


Fig. 747.

24 to 50 inches wide.

This Tuyere is rendered adjustable by a simple, but efficient process. By the action of a rod connecting the arbor which supports the valve, a rotary motion is obtained which closes or opens it to any desired extent, without disturbing the fire, thus enabling the operator to adjust his fire to his work, without labor or delay.

This Tuyere does not need to be cleaned more than once or twice a month.

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SOLID BOX WROUGHT IRON VISES.

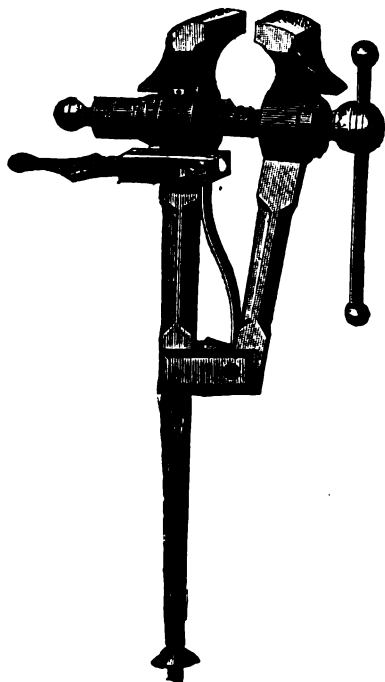


Fig. 748.

No.	Weight.	Width of Jaw.
35.....	85 lbs.	3½ pulg.
40.....	40 "	4 "
45.....	45 "	4½ "
50.....	50 "	4½ "
55.....	55 "	4½ "
60.....	60 "	5 "
65.....	65 "	5 "
70.....	70 "	5½ "
75.....	75 "	5½ "
80.....	80 "	5½ "
85.....	85 "	5½ "
90.....	90 "	5½ "
95.....	95 "	6 "
100.....	100 "	6 "
105.....	105 "	6 "
110.....	110 "	6 "
115.....	115 "	6½ "
120.....	120 "	6½ "
125.....	125 "	6½ "
130.....	130 "	6½ "
135.....	135 "	6½ "
140.....	140 "	7 "
145.....	145 "	7 "
150.....	150 "	7 "
160.....	160 "	7½ "
170.....	170 "	7½ "
180.....	180 "	7½ "
190.....	190 "	7½ "
200.....	200 "	8 "

HAND VISES.

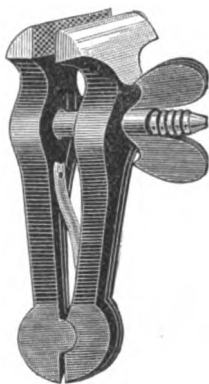


Fig. 749.

Black, Best Cast Steel.....4½, 5, 5½, 6 inch.
 Cast Steel, extra quality4½, 5, 5½, 6 "

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 FOR PRICES SEE ACCOMPANYING LIST.

ALFORD HAND VISE.

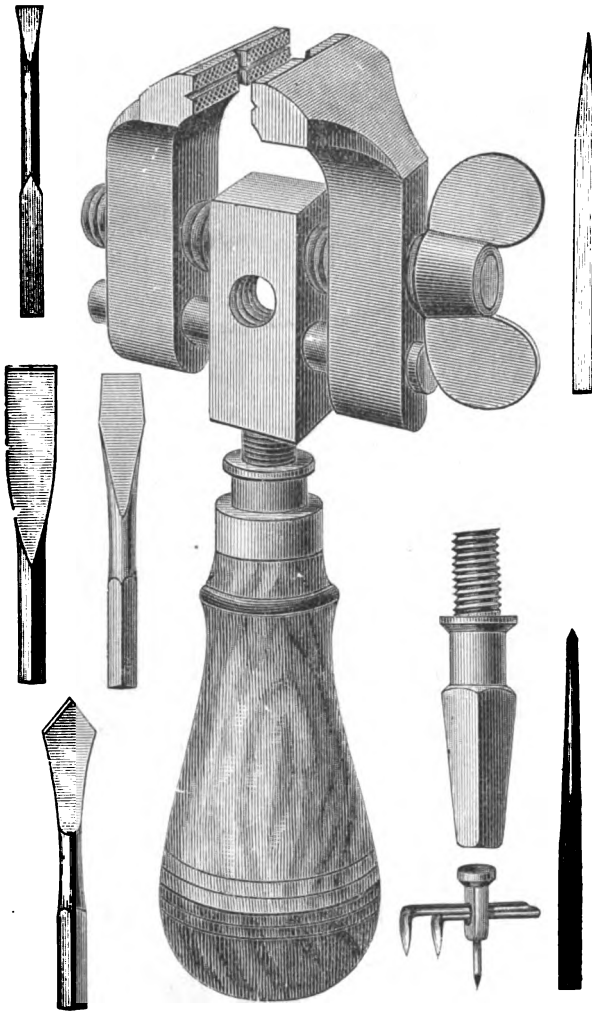


Fig. 750.

Since our last catalogue was issued we have greatly changed and improved our Hand Vise. The jaws are of forged and tempered steel, the screw and cross bar are also made of steel, the handle is made of hard maple with lignumvitæ cap, it is hollow and the bit shank and tools seen in the cut are placed inside. The blade bent at right angle fits the long groove in the jaws and is used for cutting washers, while the awl shown in the cut is placed in the short groove for a center spur.

The Vise Jaws are $1\frac{1}{2}$ inches wide and open $1\frac{1}{4}$ inches. They will center and hold firmly tools of any shape. The Vise is one-third larger than the cut, while the tools are full size. The handle can be unscrewed from the vise and the bit shank put in its place, to be used with a bit brace for any kind of boring, drilling or cutting washers. The handle can also be screwed into the vise at right angles with its usual position, which is desirable for many kinds of work.

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IMPROVED PARALLEL VISE

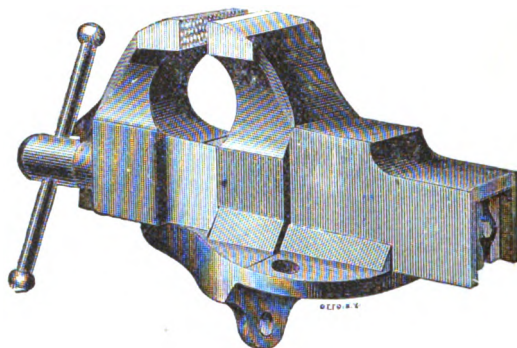


Fig. 751.

Sizes..... 2, 2½, 3, 3½, 4, 4½, 5, 6 inch width of jaws.

IMPROVED SWIVEL VISE.

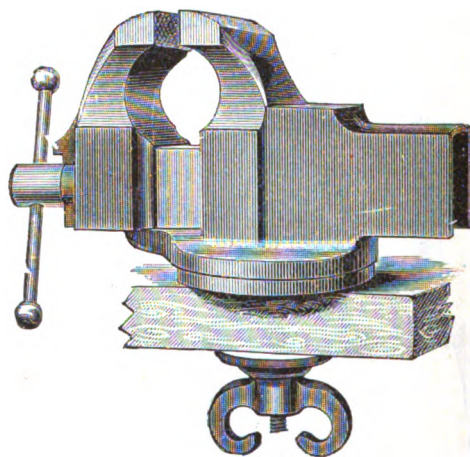


Fig. 752.

Sizes..... 2, 2½, 3½ inch width of jaws.

LIGHT PARALLEL BENCH VISE.

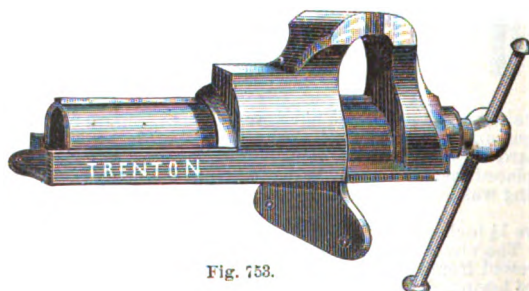


Fig. 753.

Sizes..... 2, 2½, 3, 3½, 4, 4½ inch width of jaws

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STEPHEN'S PATENT VISE.

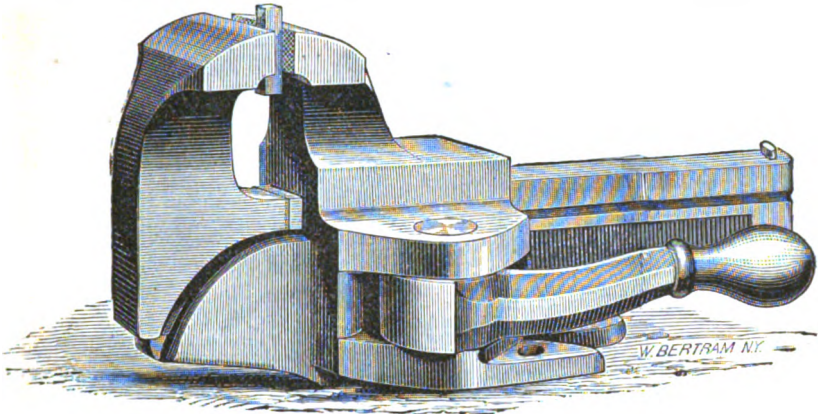


Fig. 751.

Flat Base. Sizes, 2 $2\frac{1}{2}$ 3 $3\frac{1}{2}$ 4 $4\frac{1}{2}$ 5 $5\frac{1}{2}$ 6 $6\frac{1}{2}$ inches, width of jaw.

SECTIONAL VIEW, SHOWING WORKING PARTS.

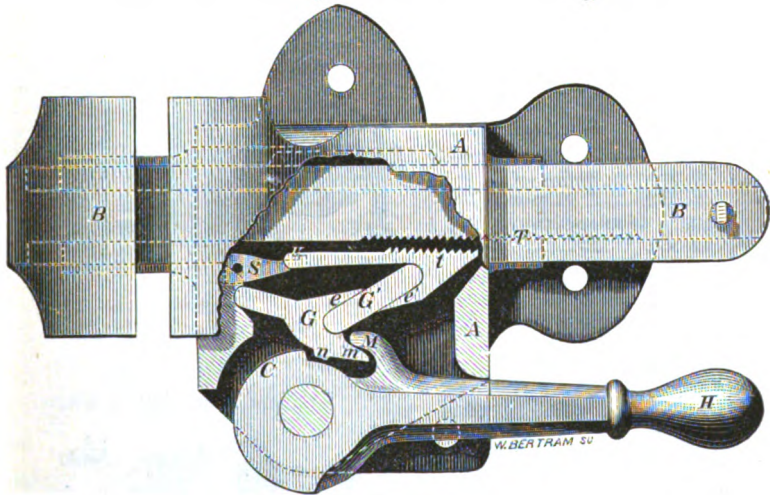


Fig. 755.

It consists simply of a Toggle, *GG*, and Tooth-Bar, *t*, held together by a Spring, *S*. The Hook, *M*, and Cam, *C*, on the Handle, *H*, work the Toggle-Joint.

A Steel Rack, *T*, is inserted in the sliding Bar, *BB*.

The Sliding Bar is here seen disengaged, free to be slid either in or out, with perfect ease, to its extreme limits.

At the first move of the Handle outward, the Hook, *M*, slips from the Tooth, *m*, and the Spring, *S*, draws down upon a hook at *U*, firmly setting the Tooth Bar, *t*, against the Rack, *T*; as the Handle is pulled further outward, the Cam is brought to bear against the ridge, *n*, nearly straightening the Toggle, and forcing the movable jaw with great power against the thing between the jaws.

We also furnish these Vises without swivel bases, and with following attachments, viz.: Self-adjusting Taper Jaws, Adjustable Pipe Grip, Wood-working Jaws, Brass Caps.

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PRENTISS' PATENT VISES

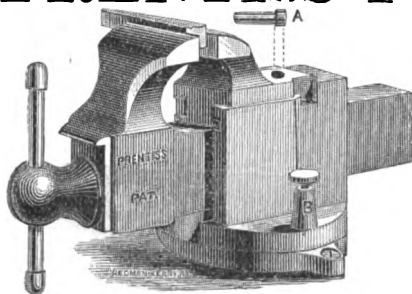


Fig. 756.

MACHINISTS' SWIVEL VISE.

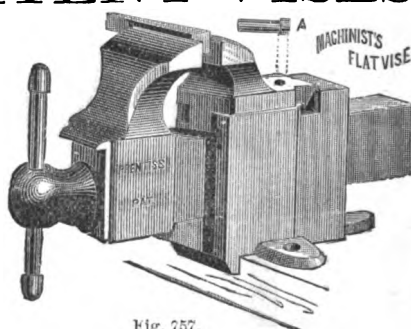


Fig. 757.

DESCRIPTION.

The Back Jaw of Prentiss' Patent Vise is adjustable, and in use conforms by automatic action to any angle, adjusting itself to and making firm the object held, whether it be straight, bevelled or wedge-shaped. The Patent Swivel Bottom is fully as strong as the stationary or solid bottom, and can be instantly adjusted to any position, right or left, at will of operator, by simply raising ratchet pin B (as seen in cut).

SIZES.

Machinists' or Iron-Workers' Vises.

Width of Jaw.	Weight, Flat Vise.	Weight, Swivel Vise.	Opens.
2½ in.	13½ lbs.	17 lbs.	8½ in.
3½ in.	28 lbs.	32 lbs.	4½ in.
4½ in.	54 lbs.	65 lbs.	6 in.
5½ in.	96 lbs.	109 lbs.	8 in.
6 in.	146 lbs.	166 lbs.	9 in.
7 in.	184 lbs.	207 lbs.	11 in.

Coach Makers' or Wood-Workers' Vises.

3½ in.	30 lbs.	34 lbs.	7 in.
4½ in.	59 lbs.	67 lbs.	9½ in.

Finishing or Filers' Vise.

4 in.	32 lbs.	36 lbs.	5 in.
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Jewelers' and Watch-Makers' Vises.

1½ in.	1½ lbs.	2 lbs.	1½ in.
2 in.	3½ lbs.	4½ lbs.	2 in.

Wood-Workers' Vise, Flat or Swivel.

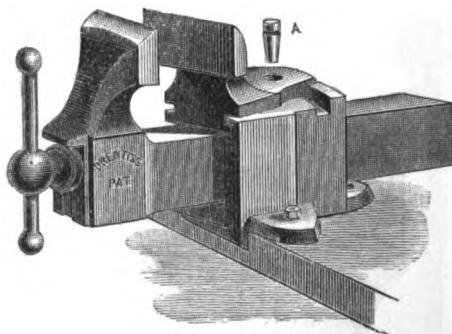


Fig. 760.

Filers' Vise, Flat or Swivel.

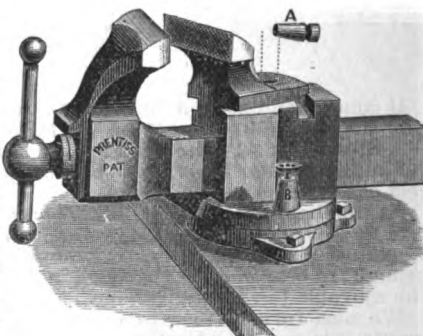
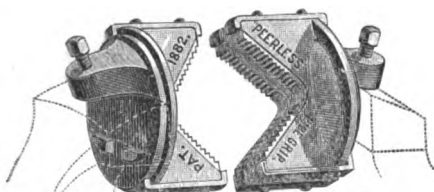


Fig. 758.



"PEERLESS" (SWIVEL) PIPE GRIP.

Fig. 759.

The Swivel Jaw Pipe Grip readily adjusts itself to whatever angle the object held may require, thereby obviating all loss of time in the adjustment of rests or bearings for long pipes. It also enables the operator to hold short pipes, couplings, thimbles, bolts, &c., in a vertical, slanting or horizontal position. It is manufactured with the best Tool Steel Holding Bits, which can be Removed, Tempered, Sharpened or Replaced whenever required. Interchangeable, and all parts supplied. Can be used on any vise.

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PARKER'S PATENT VISES.

PARALLEL, ROUND JAW VISE.

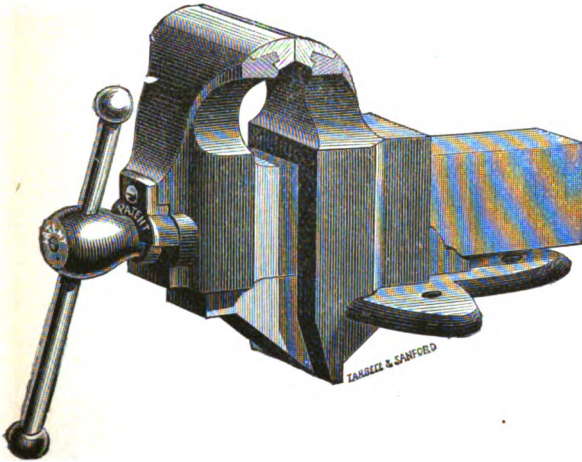


Fig. 761.

SIZES.		
No.	Width of Jaw.	Weight.
000	3½ inches.	23 pounds.
1	3½ "	34 "
2	4½ "	42½ "
3	4½ "	61 "
4	5½ "	83 "
5	6½ "	127 "
6	8½ "	245 "

PARALLEL, SWIVEL, ROUND JAW VISE.

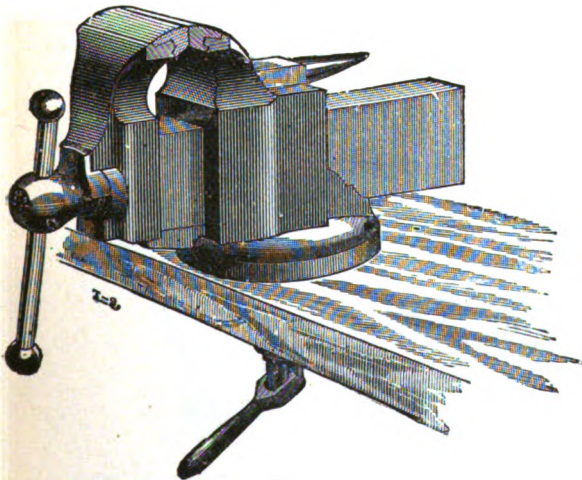


Fig. 762.

SIZES.		
No.	Width of Jaw.	Weight.
19	1½ inches.	8 pounds.
20	2½ "	8½ "
21	3½ "	24 "
22	3½ "	38 "
23	4½ "	49 "
24	4½ "	67 "
25	5½ "	90 "
26	6½ "	131 "

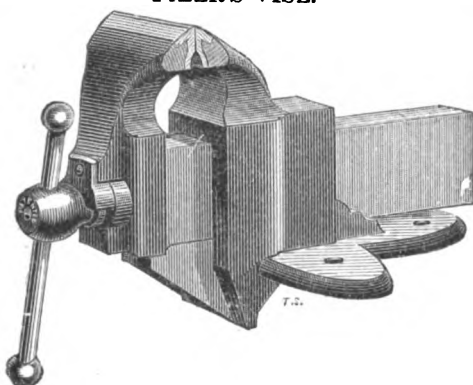
The Nos. 23 to 26 are without the cast steel anvil.

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PARKER'S PATENT VISES.

FILER'S VISE.



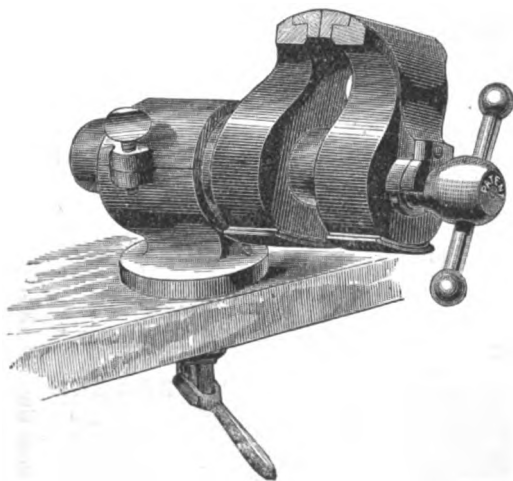
SIZES.

	Width of Jaw.	Weight.
No. 12.	4½ inches.	35 lbs.
" 42½.	3½ "	30 "
" 44.	4½ "	38½ "

No. 44 is a swivel vise.

Fig. 763.

DOUBLE SWIVEL VISE.



SIZES.

	Width of Jaw.	Weight.
No. 10.	2½ inches.	8 lbs.
" 11.	3½ "	25 "
" 12.	3¾ "	35 "
" 13.	4½ "	54 "
" 14.	4¾ "	75 "

Fig. 764.

JEWELER'S CLAMP VISE.

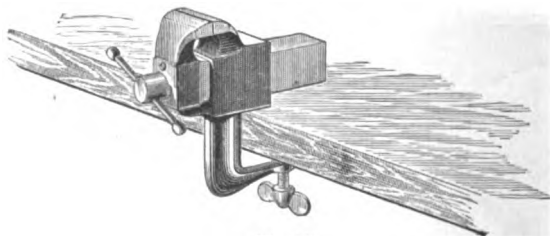


Fig. 765.

No. 16. Width of Jaw 1½ inches; weight 2½ lbs.

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PARKER'S PATENT VISES.

JEWELERS' VISE.

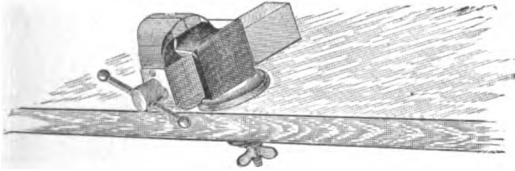


Fig. 766.

SIZE.

	Width of Jaw.	Weight.
No. 18.	1½ inches.	2½ lbs.

JEWELERS' VISE—SWIVEL JAW.

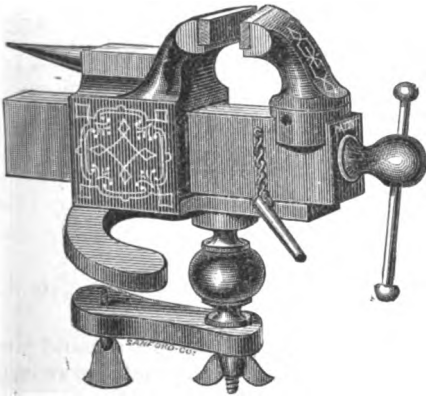


Fig. 767.

SIZES.

Width of Jaw.

No. 48.	1¾ inches.
" 49.	1¾ "

No. 49 has a screw and thumb nut, instead of fastening arrangement shown in cut.

COACHMAKERS' VISE—PLAIN OR SWIVEL.

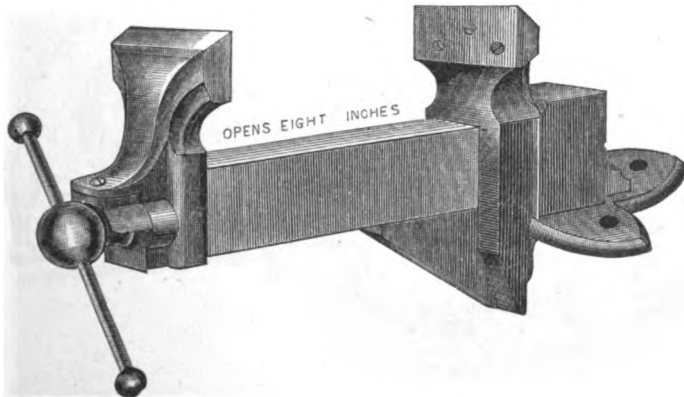


Fig. 768.

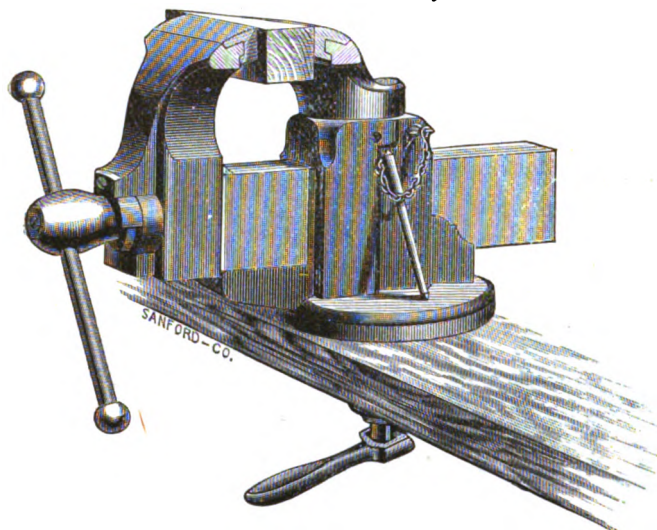
SIZE.	No. 40, plain.	Width of Jaw	4¾ inches ; opens	9 inches.
"	" 46, swivel.	"	4¾ "	" 8 "

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FOR PRICES SEE ACCOMPANYING LIST.

PARKER'S PATENT VISES.

SWIVEL JAW VISE.



No.	Width of Jaw.	Weight.	
		— pounds.	
41.....	4½ inches.....	46	"
50.....	3¾ ".....	58	"
51.....	4½ ".....	62	"
52.....	4½ ".....		

Fig. 769.

No. 41 is a Coachmakers' Vice, jaws open 9 inches. Nos. 50 to 52 are round jaw vises. Nos. 50 and 52 have the front jaw swivel, and No. 51 has the back jaw swivel.

DIE SINKERS' ADJUSTABLE VISE.

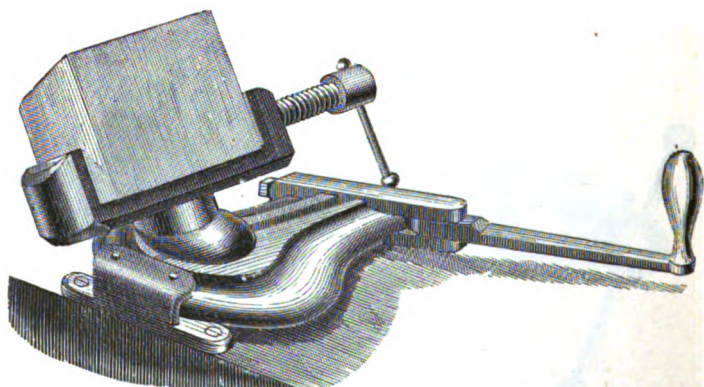


Fig. 770.

We also furnish the Ball Attachment combined with No. 1 or No. 2 Vise, making a very convenient arrangement for Filing Mills, Reamers, Drills, etc. It can be set instantly, so as to get the required light on the work.

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FOR PRICES SEE ACCOMPANYING LIST.

Saw Filer's Adjustable Vice.

No 47.

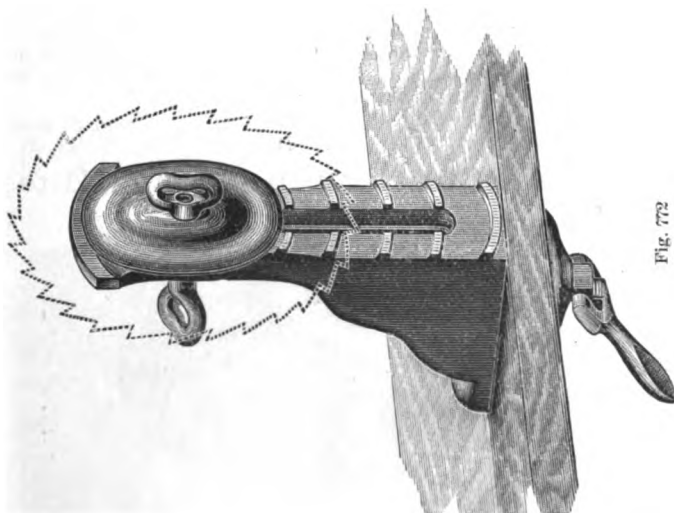


Fig. 772

Circular Saws, from 5 to 24 inches diameter, can be filed in this Vice. The adjustment is very simple.

Saw Filer's Vice.

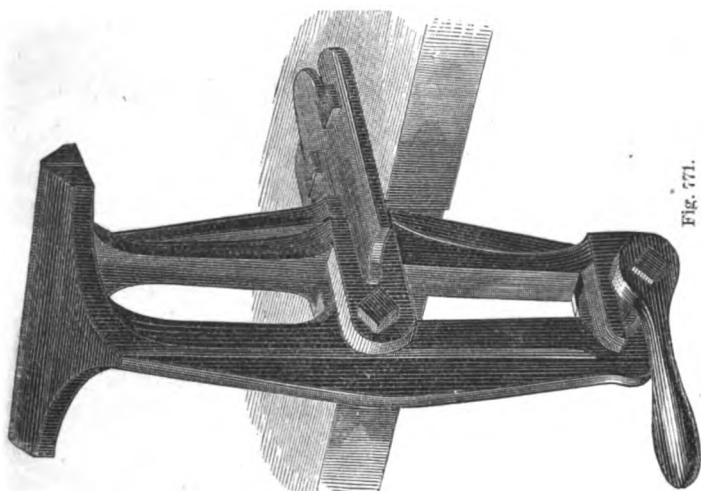


Fig. 771.

No. 48. Length of Jaws 9 inches.
 No. 49. " " 12 "
 The No. 48½ is jointed near the bench so that the jaws can be thrown backward or forward.

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HORTON'S PATENT CHUCKS.

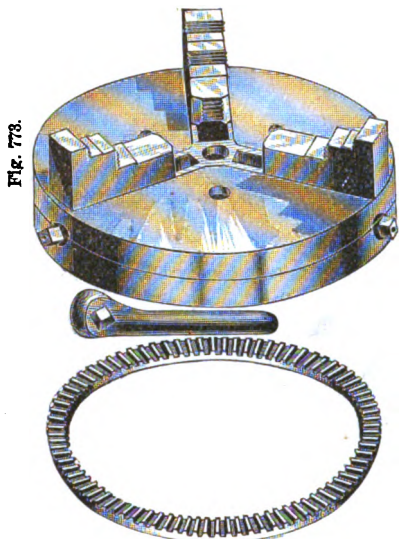


Fig. 773.

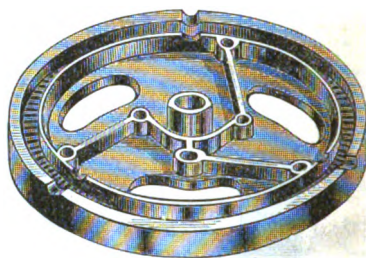


Fig. 774.

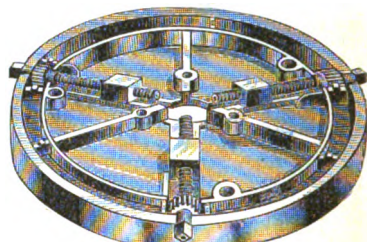


Fig. 776.

The cuts above give views of HORTON'S PATENT LATHE CHUCK, together, and in its parts. The jaws are moved to and from the center simultaneously, by means of the geared screws and the circular rack, which is enclosed in the deep groove or recess in the back plate, the center faces of both front and back plates making a perfectly tight casing for the gearing, so that no dirt, chips, etc., can possibly get into them to clog or injure the Chuck. When the rack is taken out, especially from the Four-Jaw, it makes a superior independent Jaw Chuck, two Chucks combined in one. The jaws are made solid, forged of one piece of metal of the very best quality wrought iron, and thoroughly case-hardened with animal coal, and the geared screws and circular rack are of steel.

Sizes, 4 6 9 12 15 18 21 24 30 and 36 inch, 8 jaw.
 " 6 9 12 15 18 21 24 30 36 " 42 " 4 "

Horton's Chuck with Outside Bites.

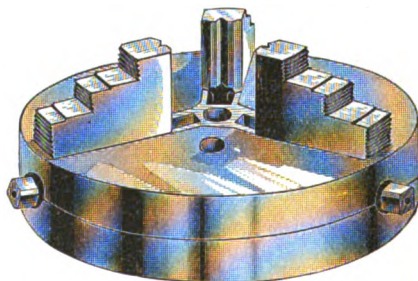


Fig. 777.

This cut gives a view of our 6 and 9 inch Reverse Jaw Chucks with Outside Bites. We use the Patent Raised Seat on this style of jaw on all sizes, the same as on our Common Jaw. *These are not kept in stock, but all sizes will be made to order.* Prices same as corresponding sizes of Common Jaw Chuck.

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FOR PRICES SEE ACCOMPANYING LIST.

HORTON'S REVERSE JAW CHUCK. HORTON'S INSIDE JAW CHUCK.

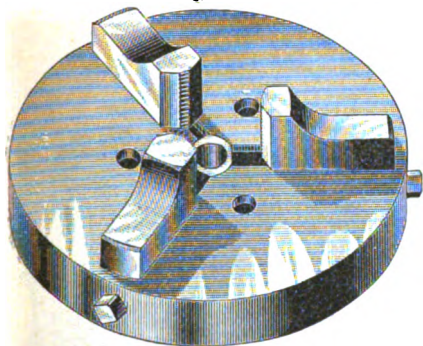


Fig. 778.

This Chuck is used on Screw Machines, and for holding Pipe, Rods, Drills, Dies, etc. It is generally known as the one used on the Brown & Sharpe Universal Milling Machine. The hole in center of the 6-inch Chuck is $1\frac{1}{4}$ inches in diameter, and will allow a pipe or rod of that size to pass entirely through the Chuck. These jaws have a firm grip on the work, the bite being on both sides of the carrying screws. We make all sizes with this style of jaw, and keep 4, 6 and 9-inch in stock. Price same as common Jaw Chuck.

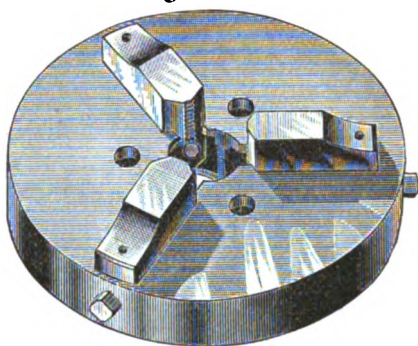


Fig. 779.

This Chuck is used largely for holding Screws, Rods, Twist Drills, etc. The bite of jaw is outside of Chuck, which carries the work away from it, so that it can be readily worked at. For Hand Tool Work and Brass Finishers it makes a *very superior* Chuck. It is also the best Drill Chuck in market, holding large drills very firmly. We keep this style in stock up to 12 inches, and can furnish larger if wanted. Prices same as Common Chuck.

The Horton Car-wheel Chuck.

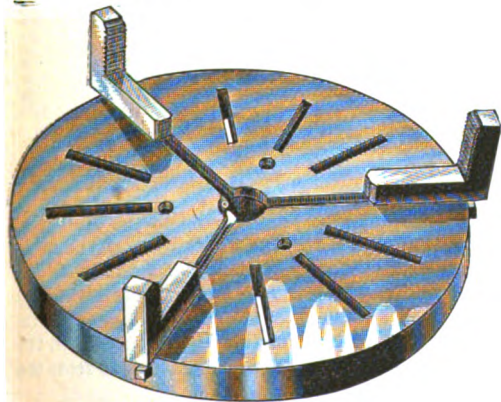


Fig. 780.

This Chuck can be attached to a Boring Machine Table or Lathe, and will hold a Car-wheel 37 inches in diameter and less. The jaws are faced with steel and made long to fit both thread and flange of car-wheels, thus truing them both ways. For general machine work it is very useful, and will hold firmly any work that can be held in a Chuck.

We make Car-wheel Chucks from 30 to 42 inches.

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FOR PRICES SEE ACCOMPANYING LIST.

The National Combination Lathe Chuck.

UNIVERSAL, INDEPENDENT, ECCENTRIC.

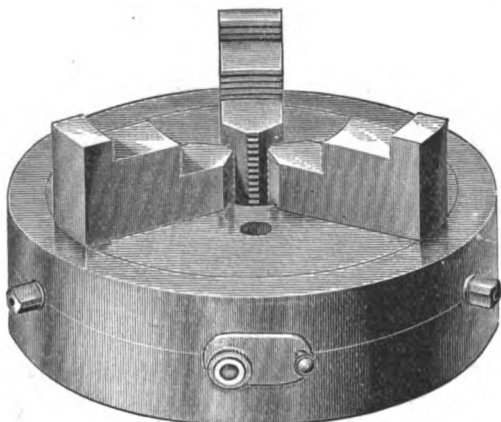


Fig. 781.
Front View.

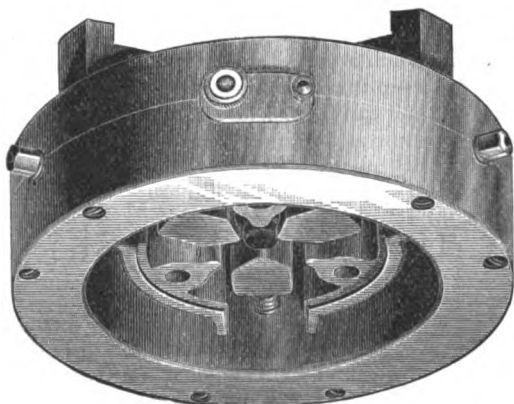


Fig. 782.
Back View.

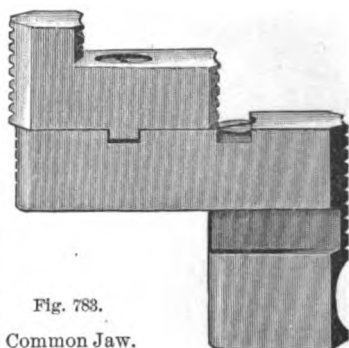


Fig. 783.
Common Jaw.

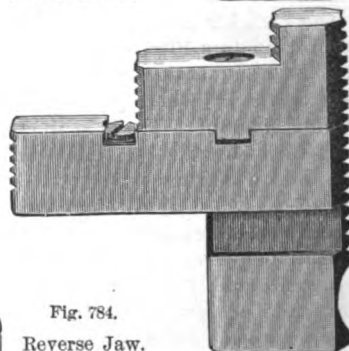


Fig. 784.
Reverse Jaw.

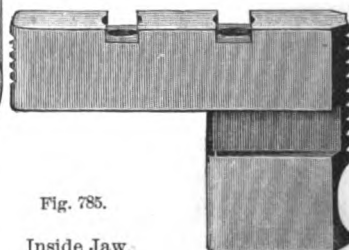


Fig. 785.
Inside Jaw.

The mechanism consists of a circular rack and pinion screws common to the Universal Chuck, and a loose ring, having plates attached, under the rack, and recesses in the back of the shell to receive the plates when the chuck is required to work independently.

The combination attachment is very simple and easily operated: the rack has a support under its whole width, which prevents the gear from straining apart when working, as would be the case were the rack supported only on one edge: the thumb nut being placed on the periphery of the Chuck, it is less liable to injury by careless handling when detached from the lathe.

Sizes, 6 9 12 15 18 21 and 24 inch. 3 or 4 jaws.

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FOR PRICES SEE ACCOMPANYING LIST.

"THE SWEETLAND CHUCK."

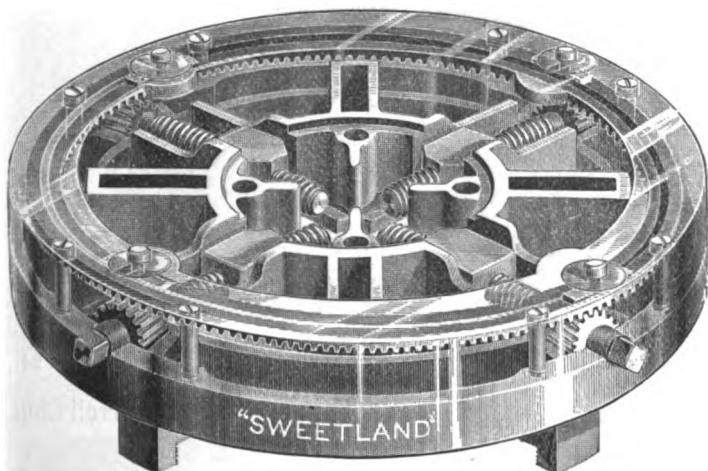


Fig. 786.

This represents the entire mechanism of "THE SWEETLAND CHUCK." The design of the improvement is to make the Chuck independent as well as universal, thus combining two Chucks in one. In the recess underneath the rack are the cam blocks, beveled to correspond with the bevel recess in the rack. The cam blocks are held in place by the convex spring washers, which allow them to be moved to or from the center without disturbing the nuts, the friction being sufficient to hold them in place. When moved to the outer portion of the rack they connect the gearing, making the chuck universal; and when moved inward they disconnect the gearing, thus making each screw independent. The advantage of making each screw independent, without disconnecting the others from the gearing, is a feature not combined in any other Chuck, and is an improvement fully appreciated by the mechanic when adjusting the jaws for eccentric, concentric, or universal work. For instance, the Chuck having been used independent, the workman wishes to change to universal, the jaws are moved inward until the outer end is true with the line on face of Chuck; now each screw can be engaged with the rack separately, by sliding the cam block inward. If one jaw is found to be out of true it can be disconnected and reset, leaving the others in mesh undisturbed.

This Chuck has a large hole in center, and will allow a drill or reamer to pass through work without injury to face of Chuck. These Chucks furnished with Common Reverse or Inside Jaws.

Sizes.....6, 9, 12, 15, 18, 21, 24, 30 and 36 inch, 8 jaw.

Sizes.....6, 9, 12, 15, 18, 21, 24 and 30 inch, 4 jaw.

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FOUR-JAW INDEPENDENT LATHE CHUCK.

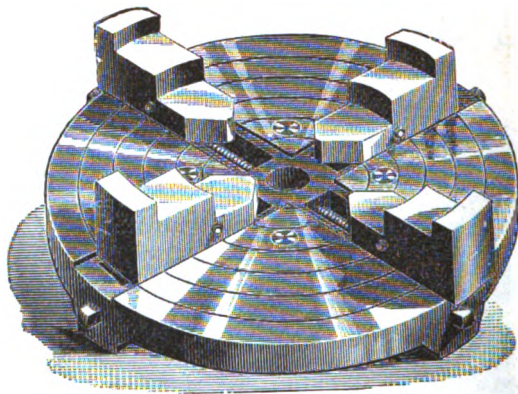


Fig. 787.

Sizes, 10, 15, 21, 24, 26 inch.

Small, Four-jaw Independent Lathe Chuck.

Geared Scroll Chuck.

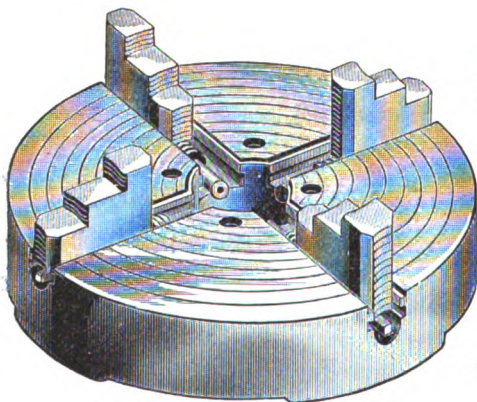


Fig. 788.

Sizes, 6, 9, 12, 15, 18, 24 inch.

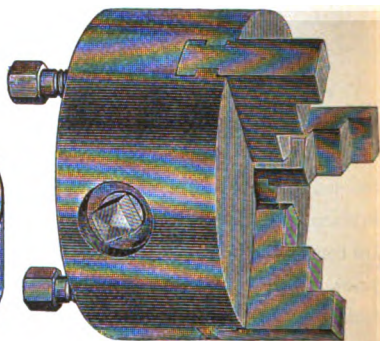


Fig. 789.

Sizes, 2½, 3, 4½, 5, 6½, 9 inch.

Geared Scroll Chuck

The "Choice" Chuck.

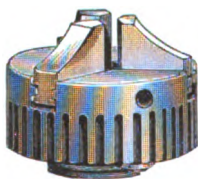


Fig. 791.

Holds Drills up to ½ inch.

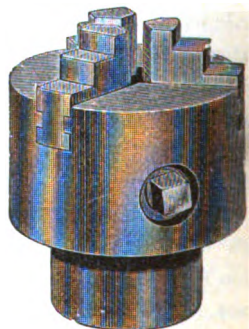


Fig. 790.

Size.. 2¼ in., holding drills from ¼ to 1 in.

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FOR PRICES SEE ACCOMPANYING LIST.

BEACH PATENT DRILL CHUCK.

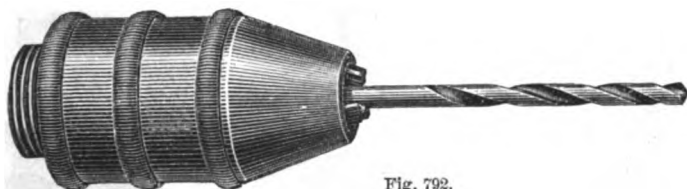


Fig. 792.

No. 0 holds 0 to $\frac{1}{4}$ inch.

" 1 " 0 to $\frac{1}{2}$ "

" 2 " 0 to $\frac{3}{4}$ "

No. 3 holds $\frac{1}{8}$ to $\frac{1}{2}$ inch.

" 4 " $\frac{3}{8}$ to $\frac{1}{2}$ "

ALMOND DRILL CHUCK.

SELF-CENTERING
LITTLE GIANT DRILL CHUCK.

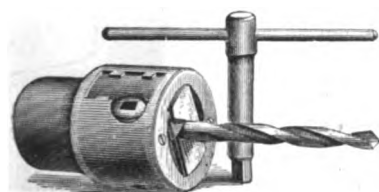


Fig. 793.

No. 1, $2\frac{1}{2}$ in. diam. holds 0 to $\frac{1}{2}$ in.

" 2, 3 $\frac{1}{2}$ in. " " 0 to 1 in.

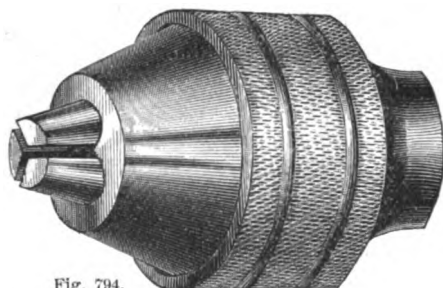


Fig. 794.

Sizes 0 to $\frac{7}{16}$ in. 0 to $\frac{1}{2}$ in.

" 0 to $\frac{1}{4}$ in.

PROUTY'S PATENT PLANER CHUCK.

The PLANER CHUCKS represented below are strong, durable, convenient, and not liable to get out of order. Will hold Regular or Irregular shaped pieces, and can be quickly adjusted from their least to their greatest capacity.

ROUND SWIVEL BASE CHUCK.

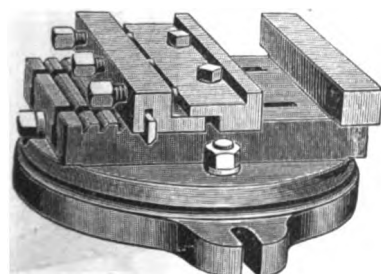


Fig. 796.

Sizes 6 8 10 13 inch.

REID DRILL CHUCK.

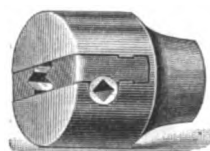


Fig. 795.

No. 1 2 3
Sizes 0 to $\frac{1}{4}$ 0 to 1 0 to 1.

SQUARE BASE CHUCK.

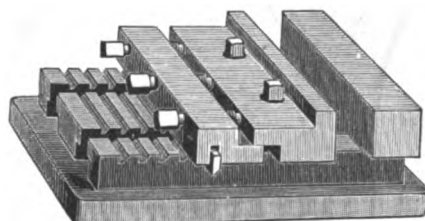


Fig. 797.

Sizes 8 10 12 15 18 inch

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FOR PRICES SEE ACCOMPANYING LIST.

MALLEABLE IRON
LATHE DOG.



Fig. 798.

$\frac{1}{4}$ to 6 inch.

LIGHT STEEL DOG.



Fig. 799.

$\frac{3}{8}$ to 4 inch.

HEAVY STEEL DOG.



Fig. 800.

$\frac{3}{8}$ to 6 inch.

"AMATEUR"
LATHE DOG.



Fig. 801.

$\frac{3}{8}$ to 1 inch.

STRAIGHT TAIL
LATHE DOG.

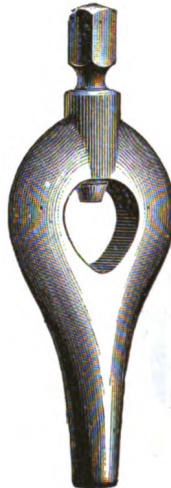


Fig. 802.

$\frac{3}{8}$ to 6 inch.

DIE DOG.



Fig. 803.

$\frac{1}{2}$ to 1 inch.

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MALLEABLE IRON CLAMP DOG.

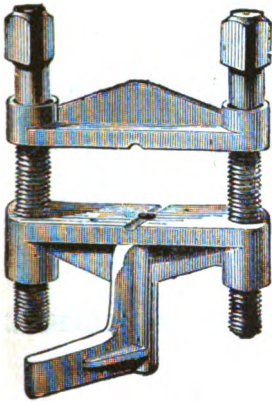


Fig. 804.

Nos. 1 to 4.

STEEL CLAMP DOG.

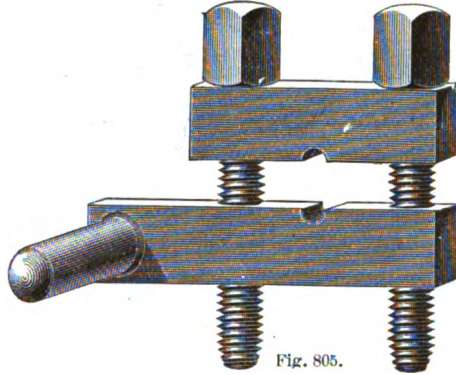


Fig. 805.

Nos. 1 2 3 4
Sizes. 1 1½ 2 inch.

STEEL BOILER CLAMP.

Opens 4 inches.

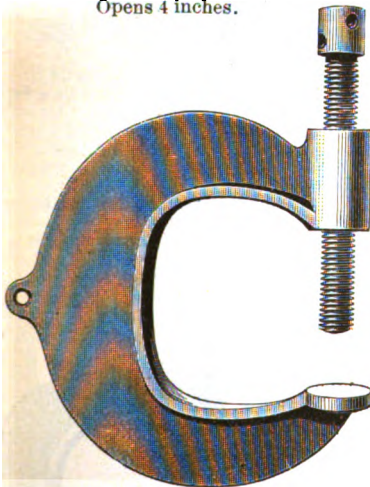


Fig. 806.

STEEL CLAMP.



Fig. 807.

No.	1	2	3	4	5	6	7	8	10	12
Opens	2	3	4	5	6	8	10	12		

BOLT DOGS.

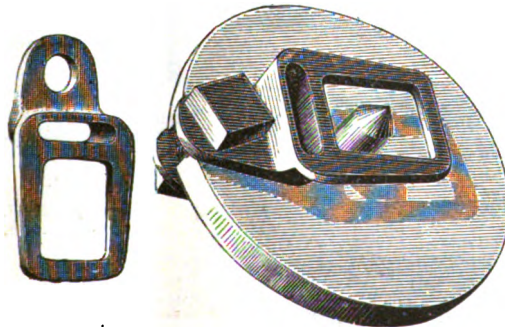


Fig. 808.

1½ to 2 inches.

STEEL DOG WRENCH.



Fig. 809.

Size, ¾ to 1 inch.

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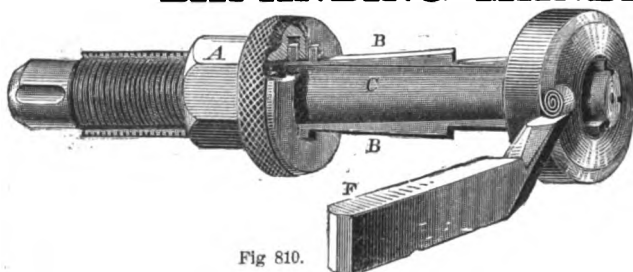
EXPANDING MANDREL.

Fig. 810.

No.	Suitable for Hole.
1	$\frac{1}{4}$ to 1 inch.
2	1 to $1\frac{1}{4}$ "
3	$1\frac{1}{2}$ to 2 "
4	2 to 3 "
5	3 to 4 "

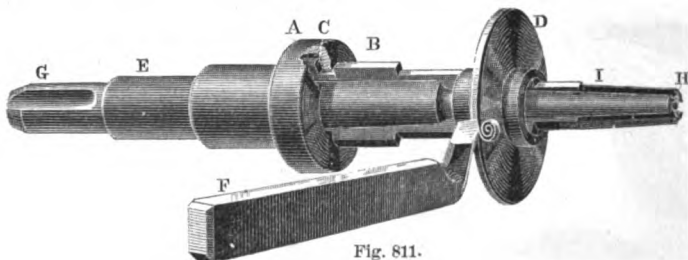
AMATEUR'S EXPANDING MANDREL.

Fig. 811.

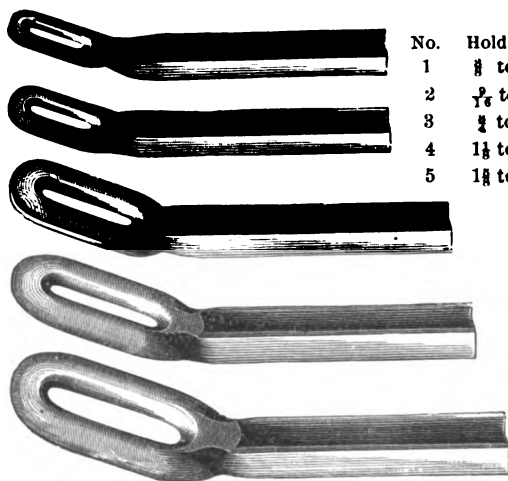
Size Hole suitable for $\frac{3}{8}$ to 1 inch.**STEEL CHUCK DRILL HOLDERS.**

Fig. 812.

No.	Holds Drills.
1	$\frac{3}{8}$ to $\frac{1}{2}$ in.
2	$\frac{1}{2}$ to $\frac{3}{4}$ "
3	$\frac{3}{4}$ to $1\frac{1}{8}$ "
4	$1\frac{1}{8}$ to $1\frac{3}{4}$ "
5	$1\frac{3}{4}$ to 2 "

Malleable Iron Clamp.

Sizes, 3 to 8 inches.

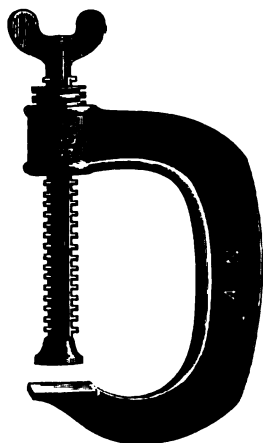


Fig. 813.

STANDARD WRENCH.

Fig. 814.

No.	Sizes Nuts Held.
1.....	$\frac{1}{2}$ and $\frac{3}{8}$ inch.
2.....	" $\frac{7}{8}$ "
3.....	" $1\frac{1}{8}$ "
4.....	" $1\frac{1}{4}$ "
5.....	" $1\frac{3}{8}$ "
6.....	" $1\frac{1}{2}$ "
7.....	" $1\frac{3}{4}$ "

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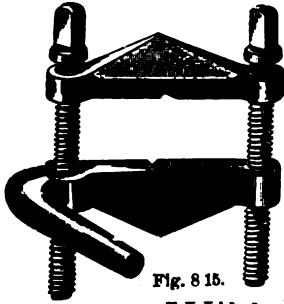
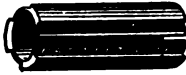


Fig. 815.

DROP FORGED CLAMP DOG.

No. 1, $1\frac{3}{4}$ inch between screws.No. 2, $2\frac{1}{4}$ " " "No. 3, $2\frac{3}{4}$ " " "

Wilde's Expansion Mandrel.



SIZES.

 $\frac{1}{2}$ to 3 inches.

Fig. 816.

The above cut represents an improved Mandrel, especially designed and adapted for fine and accurate work. It consists of two parts, a ribbed and split sleeve and a tapered mandrel. The mandrel is turned to fit the tapered hole in the sleeve, which gives a perfect bearing the length of the bore. The outer surface of the sleeve is partially removed to any desired depth, say about one-half the thickness of said sleeve, leaving three raised longitudinal bearings to engage the inner surface of the bore of the work to be turned. The sleeve is also cut apart longitudinally in one of the depressed spaces, thus allowing it to expand or contract.

As will be readily seen, this is a strictly concentric mandrel, and cannot fail to give a perfectly parallel bearing. In use it is not limited to a bore of exact size, but, being cut away on three sides to a thin shell, will accommodate itself to bores of slightly varying diameters. The work can always be held in the hand while driving the mandrel either in or out, as only a blow or two with a wooden mallet is required to tighten or loosen it.

Chantrell's Adjustable Socket Wrench.

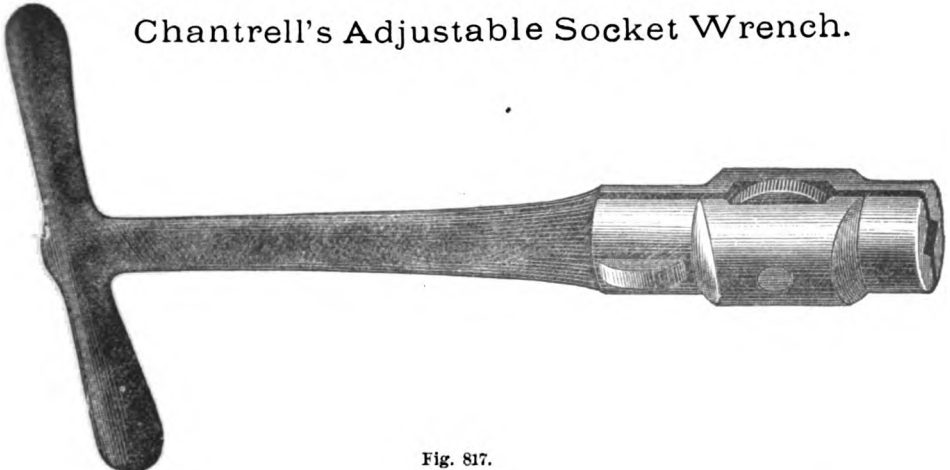


Fig. 817.

It can be used in many places that cannot be reached by other wrenches, and for putting up hangers, running taps and reamers, and putting in lag screws, it has no equal. It is also very useful in the tool room and machine shop and on the farm. It is made in three sizes and of the best material.

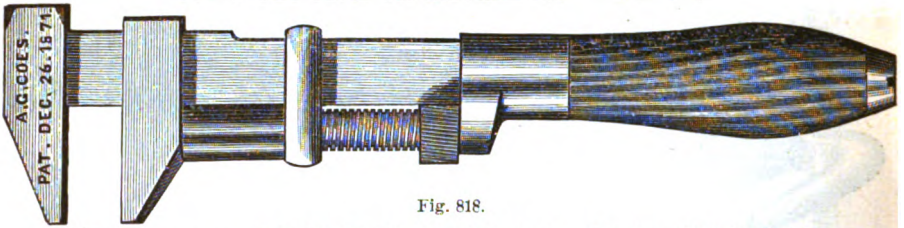
6 inch Adjustable from $\frac{1}{2}$ to $\frac{1}{2}$ inch square. 9 inch Adjustable from $\frac{1}{2}$ to $\frac{1}{2}$ inch square.

12 inch Adjustable from $\frac{1}{2}$ to 1 inch square

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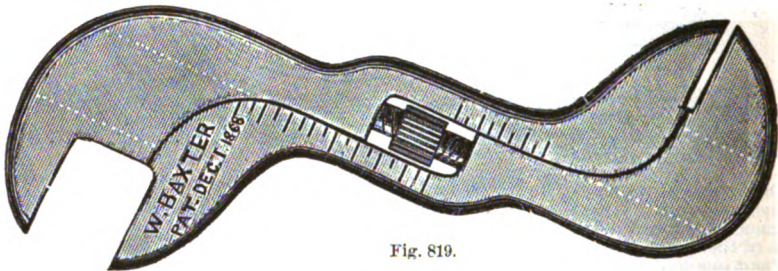
FOR PRICES SEE ACCOMPANYING LIST

COE'S GENUINE OR MECHANICS' WRENCH.

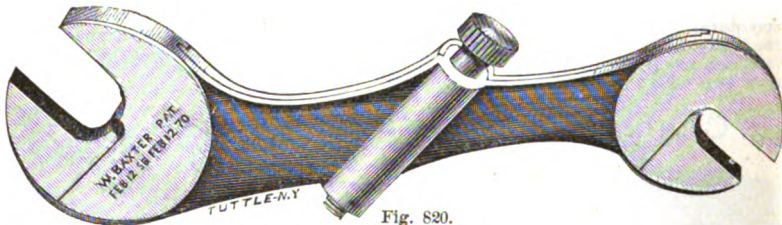


Sizes.....6, 8, 10, 12 15, 18 and 21 inch. Black or Bright finish.

BAXTER'S WRENCHES—S PATTERN.



DIAGONAL PATTERN.



Sizes.....4, 6, 8, 10 and 12 inch.

WROUGHT IRON KEY WRENCH.



Length of Jaw.....2½, 3, 3½, 4, 4½, 5 inch.

ADJUSTABLE POCKET WRENCH,
BLACK OR NICKELED.



Opens ¼ in.
Length 4½ in.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Wrought-Iron Machine Wrenches.

FULL SIZE CUTS.

No. 3.

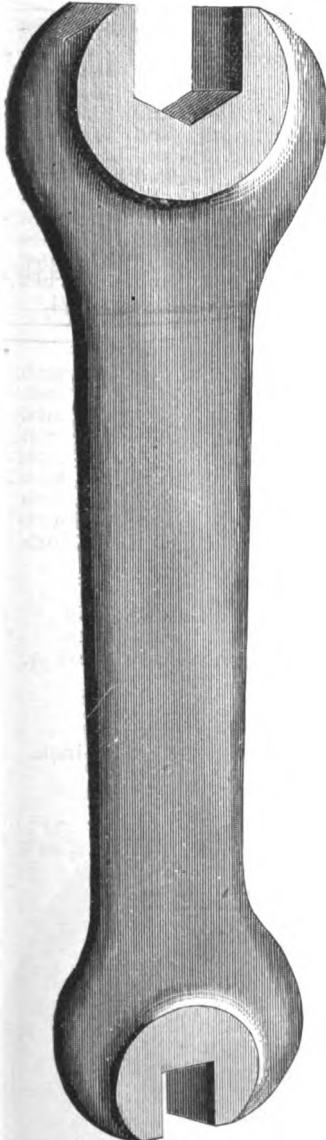


Fig. 823.

No. 5.

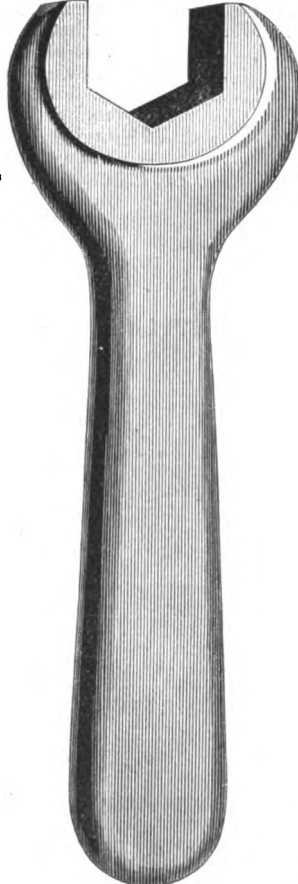


Fig. 824.

No. 10.



Fig. 825.

THUMB-NUT.

BLANK.

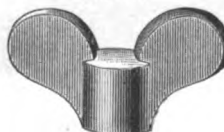


Fig. 826.

THUMB-SCREW.

BLANK.



Fig. 827.

FOR SIZES SEE NEXT PAGE.

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FOR PRICES SEE ACCOMPANYING LIST.

Sizes of Wrought Iron Wrenches, Etc.

STYLE OF No. 8.

No.	Length.	Finished Sizes.
1.....	7 $\frac{1}{4}$ inches.....	1 $\frac{1}{8}$ and $\frac{3}{8}$ inches
2.....	7 inches.....	1 and $\frac{1}{2}$ inches
3.....	6 inches.....	$\frac{3}{4}$ and $\frac{7}{8}$ inches
16.....	6 $\frac{1}{2}$ inches.....	$\frac{1}{2}$ and $\frac{5}{8}$ inches
17.....	6 inches.....	$\frac{3}{4}$ and $\frac{1}{2}$ inches
18.....	8 inches.....	1 $\frac{1}{4}$ and $\frac{3}{4}$ inches
19.....	8 inches.....	1 $\frac{1}{8}$ and $\frac{3}{8}$ inches
20.....	9 $\frac{1}{2}$ inches.....	1 and $\frac{3}{8}$ inches
21.....	8 inches.....	1 $\frac{3}{8}$ and 1 $\frac{1}{8}$ inches
22.....	7 $\frac{7}{8}$ inches.....	1 $\frac{3}{8}$ and 1 $\frac{1}{8}$ inches
23.....	9 inches.....	1 $\frac{3}{8}$ and 1 inches
24.....	10 $\frac{1}{4}$ inches.....	1 $\frac{3}{8}$ and 1 $\frac{1}{4}$ inches
25.....	10 inches.....	1 $\frac{3}{8}$ and 1 $\frac{1}{8}$ inches
26.....	10 $\frac{3}{4}$ inches.....	1 $\frac{3}{8}$ and 1 $\frac{1}{4}$ inches
27.....	6 $\frac{1}{2}$ inches.....	1 and $\frac{1}{4}$ inches

STYLE OF No. 5.

No.	Length.	Finished Sizes.
4.....	6 inches.....	$\frac{1}{2}$ inch
5.....	4 $\frac{1}{2}$ inches.....	$\frac{3}{4}$ inch
7.....	7 $\frac{3}{8}$ inches.....	1 $\frac{1}{4}$ inch
8.....	6 inches.....	$\frac{7}{8}$ inch
11.....	4 $\frac{1}{2}$ inches.....	$\frac{7}{8}$ inch
12.....	4 $\frac{3}{4}$ inches.....	$\frac{7}{8}$ inch
14.....	13 inches.....	1 $\frac{1}{4}$ inch
15.....	10 inches.....	1 $\frac{1}{4}$ inch
39.....	19 $\frac{1}{2}$ inches.....	1 $\frac{1}{2}$ inch

STYLE OF No. 10.

Number.....	6	9	10
Length, inches.....	5 $\frac{1}{4}$	6 $\frac{3}{4}$	3 $\frac{3}{8}$
Finished Sizes, inches.....	1 $\frac{1}{4}$ and $\frac{7}{8}$.	1 and $\frac{3}{8}$.	$\frac{7}{8}$ and $\frac{3}{8}$.

THUMB NUTS—Fig. 826.

Number.....	0	1	2	8	4
Will tap for bolt.....	$\frac{1}{8}$.	$\frac{1}{8}$.	$\frac{3}{8}$.	$\frac{7}{8}$.	$\frac{1}{2}$ inch.

THUMB SCREWS—Fig. 827.

Diam.....	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{7}{8}$	$\frac{3}{8}$
Lengths.....	$\frac{1}{4}$ to 5	$\frac{1}{4}$ to 5	$\frac{1}{4}$ to 5	1 to 5	1 to 5	1 to 5	2 $\frac{1}{2}$ to 5

MACHINE HANDLES.

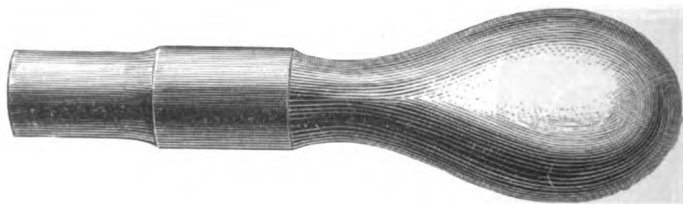


Fig. 828.

SIZES.

Length.....	3 $\frac{1}{2}$.	4.	4 $\frac{1}{2}$.	5 $\frac{1}{2}$.	5 $\frac{1}{2}$ and 6 inches.
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PLIERS.

FLAT NOSE.

ROUND NOSE.

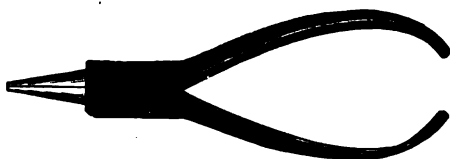
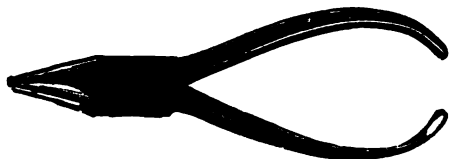


Fig. 829.

Sizes, 4 4½ 5 5½ 6 6½ 7 8 inch.

Fig. 830.

FLAT CUTTER.

RAISED CUTTER.

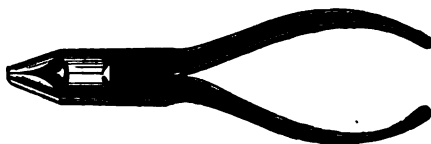
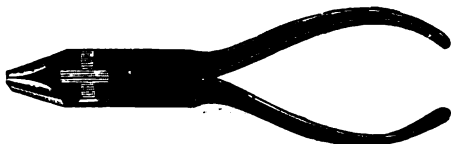


Fig. 831.

Sizes, 5 5½ 6 6½ 7 8 inch.

Fig. 832.

CUTTING NIPPERS.

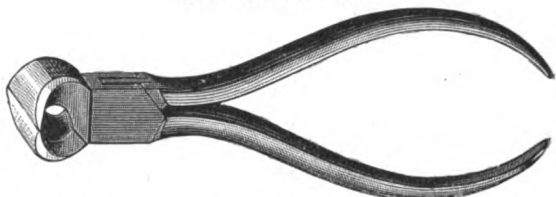
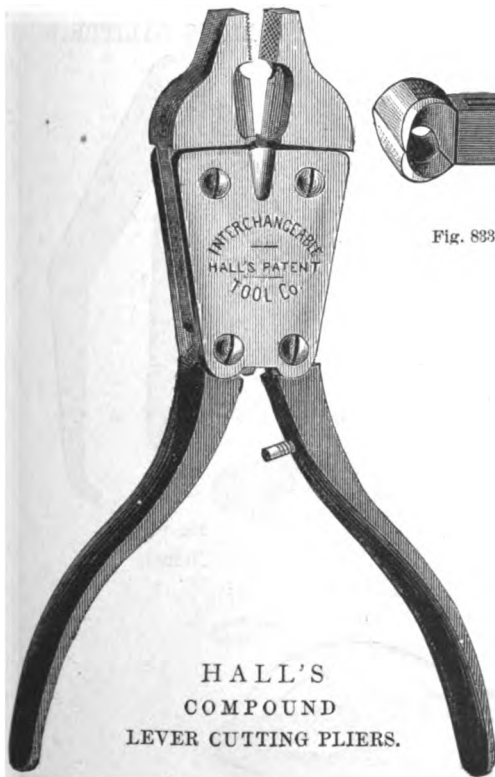


Fig. 833.

Sizes, 5 5½ 6 6½ 7 8 9 inch.



HALL'S
COMPOUND

LEVER CUTTING PLIERS.

Fig. 834.

Sizes, 6 and 8 inches.

HALL'S CUTTING NIPPERS.

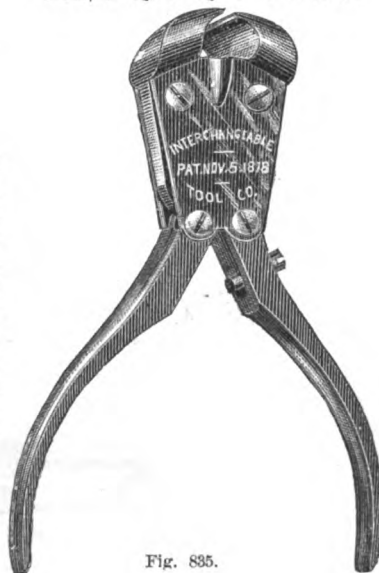
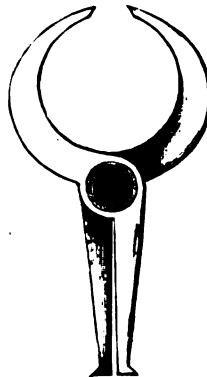


Fig. 835.

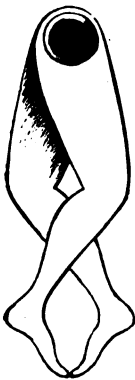
Sizes, 4, 5 and 7 inches. Cuts 0 to ½.

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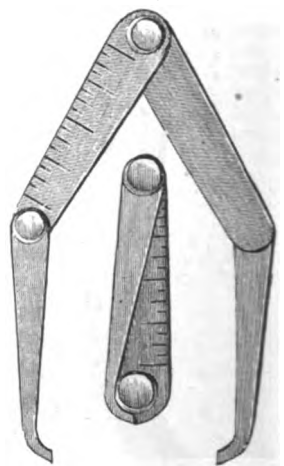
FOR PRICES SEE ACCOMPANYING LIST.

CALIPERS.**Outside Caliper.****Fig. 836.**Sizes $2\frac{1}{2}$ to 24 inch.**Inside Caliper.****Fig. 837.** $2\frac{1}{2}$ to 24 inch.**Double Caliper.****Fig. 838.**

3 to 6 inch.

Navy Caliper.**Fig. 836.** $3\frac{1}{2}$ inch.**FANCY CALIPER.****Fig. 840.**Size, $2\frac{1}{2}$ inch.**Outside and Inside Caliper.****Fig. 841.**

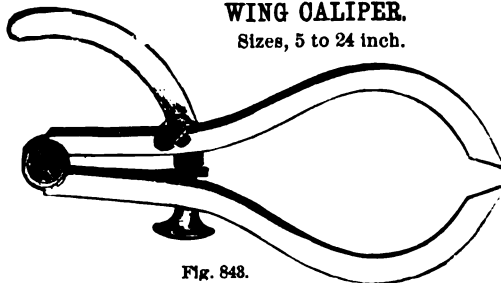
6 inch.

FOLDING CALIPER.**Fig. 842.**

6 inch.

WING CALIPER.

Sizes, 5 to 24 inch.

**Fig. 843.**

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CALIPERS AND DIVIDERS.

REGISTER CALIPERS.—NICKELED.



Fig. 844.

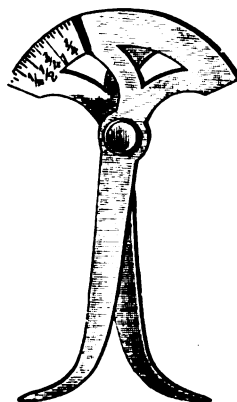


Fig. 845.

Size.....3 inches.

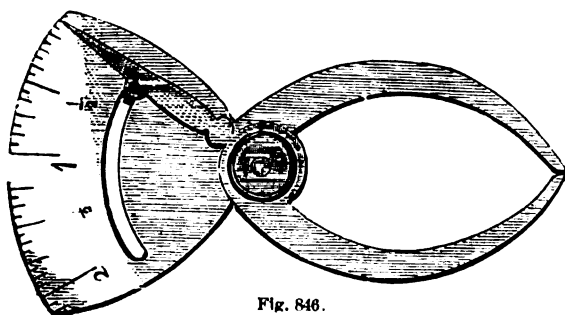


Fig. 846.

Size.....3 inch.

PLAIN COMPASS DIVIDERS.



Fig. 848.

Sizes.....3 to 8 inches.

WING COMPASSES.



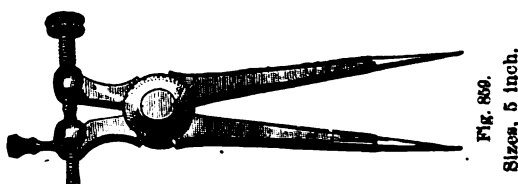
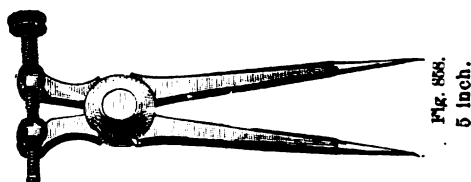
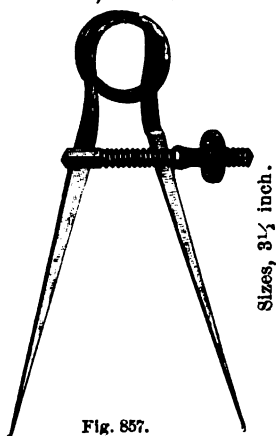
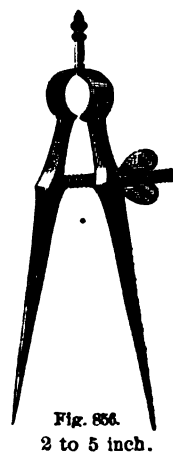
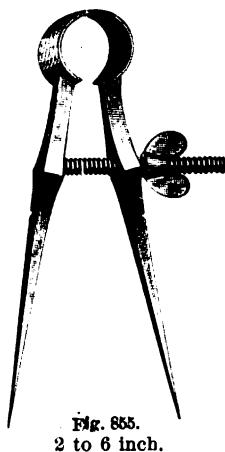
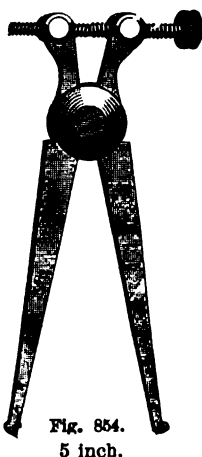
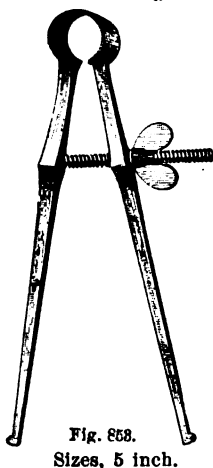
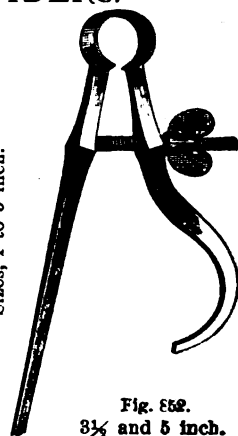
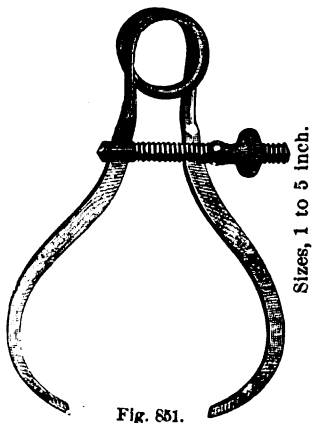
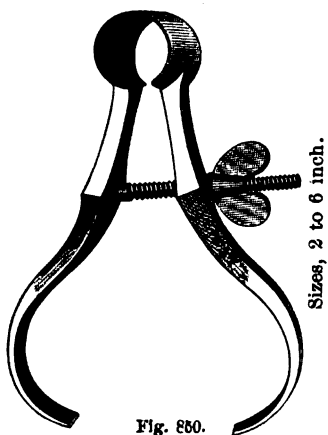
Fig. 849.

Sizes.....5 to 24 inches.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

SPRING CALIPERS AND DIVIDERS.



22 CORTLANDT STREET, NEW YORK.

Hammer and Circular Saw Sets.

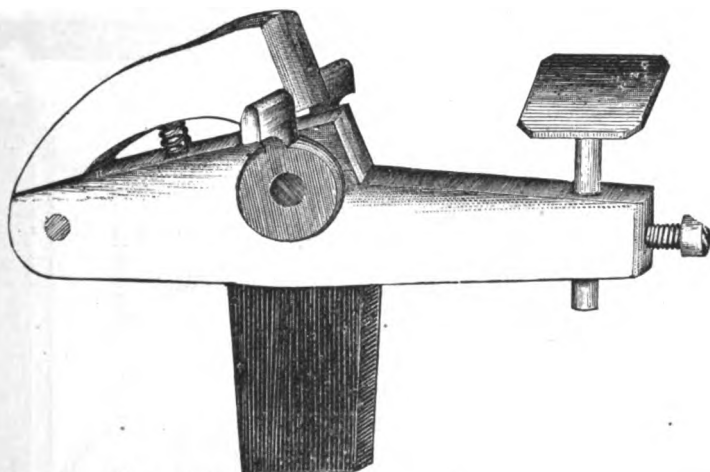


Fig. 861.

Surface Gauge.

Washer Cutter.

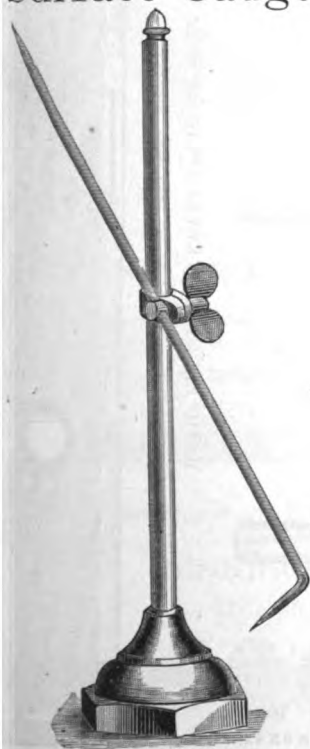


Fig. 860.

.....18 and 18 in.

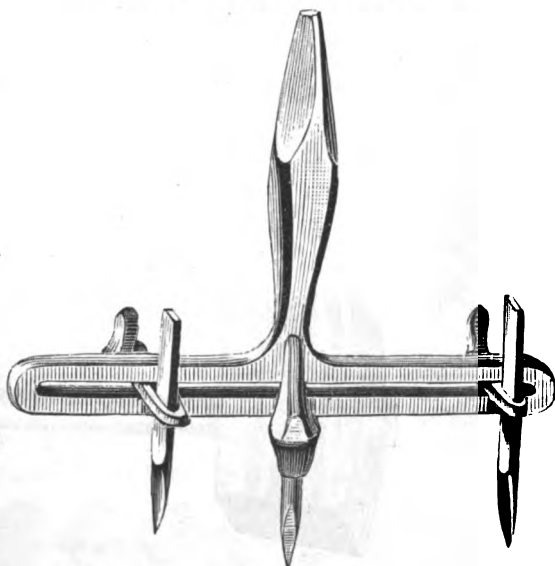


Fig. 862.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

LEVELS AND PLUMBS**MACHINISTS'—IRON.****Fig. 863.**

Size, 6 inch.

IRON POCKET LEVEL.**Fig. 864.**

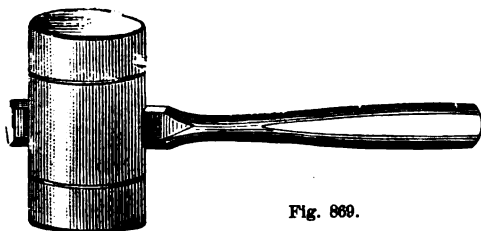
Sizes, 3 and 5 inch.

ADJUSTABLE BENCH LEVEL—IRON.**Fig. 865.**

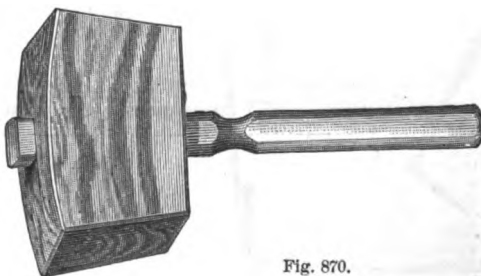
Sizes, 3 and 5 inch.

MACHINISTS'—IRON.**Fig. 866.**

Sizes, 12 18 and 24 inch.

MALLETS—ROUND.**Fig. 869.**

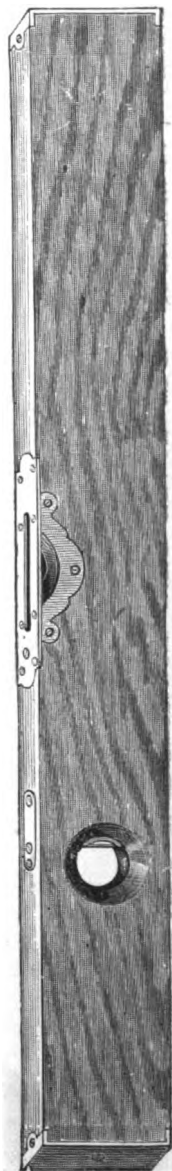
No.	1	2	3
Sizes,	5 x 3 in.	5½ x 3½ in.	6 x 4 in.

MALLETS—SQUARE.**Fig. 870.**

No.	8	9	10
Sizes,	6 x 2½ x 3½ in.	6½ x 2½ x 3½ in.	7 x 3 x 4 in.

MACHINISTS' OR CARPENTERS'—IRON.**Fig. 867.**

Sizes, 12
18 and 24
inch.

WOOD PLUMB AND LEVEL—PLAIN OR BRASS TIPPED.**Fig. 868.****22 CORTLANDT STREET, NEW YORK.****FOR PRICES SEE ACCOMPANYING LIST.**

UPRIGHT AND ANGULAR WOOD BORING MACHINES. Screw Drivers.

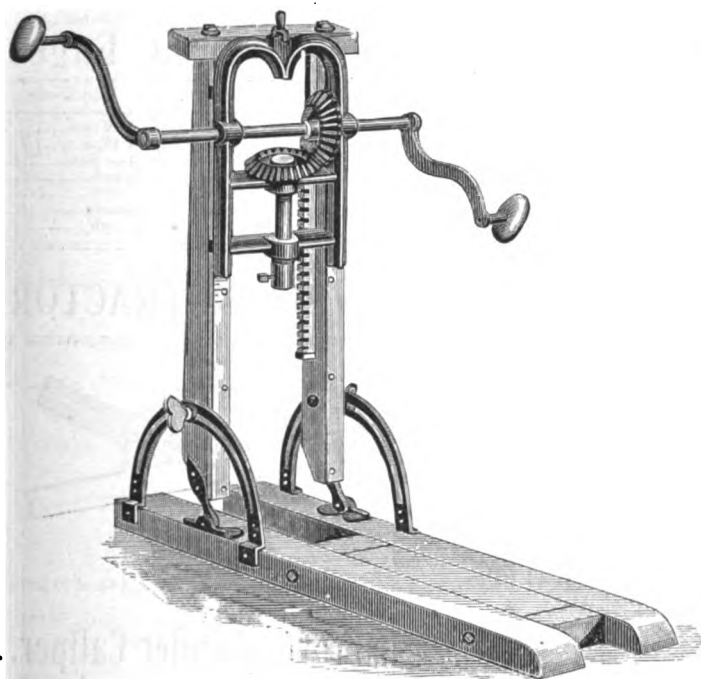
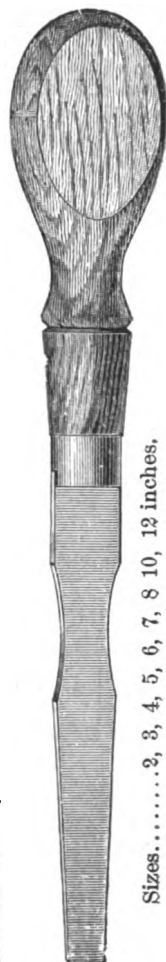


Fig. 871.



Sizes.....2, 3, 4, 5, 6, 7, 8 10, 12 inches.

Fig. 873.

ONE AND TWO FEET, FOUR-FOLD RULES.



Fig. 872.

Plain Brass Tipped and Brass Bound. Also, 6 inch Rules with Caliper Slide.

JENNINGS' EXTRA AUGER BITS.

FOR BRACES OR BORING MACHINES.

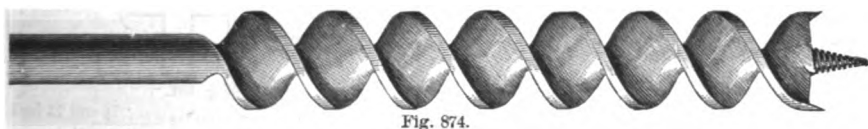
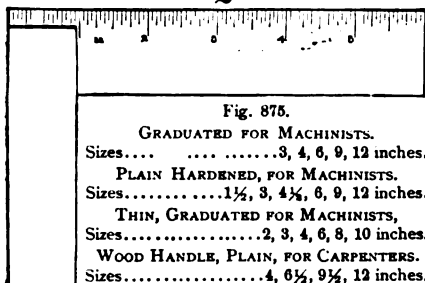


Fig. 874.

22 CORTLANDT STREET, NEW YORK.

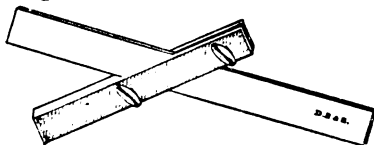
FOR PRICES SEE ACCOMPANYING LIST.

STEEL SQUARES.



HARDENED CAST STEEL

T Square and Universal Bevel.



Length of head.....5 inches.
Length of tongue.....8 inches.

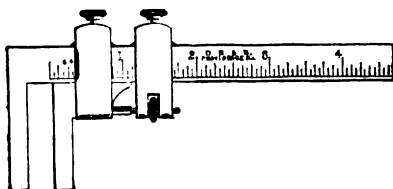
Steel Caliper Rules.



These Rules are divided in four ways. A, divided on outside like cut, on slide to 32ds and 64ths. B, divided on outside like cut, on slide to 64ths and 100ths. C, divided on outside to 8ths, 16ths, 32ds and 64ths; on slide to 32ds and 64ths. D, divided on outside to 8ths, 16ths, 32ds and 64ths; on slide to 64ths and 100ths.

Length of Rule.....3 inches.
Length Calipered.....2½ inches.

CALIPER SQUARES.



One side divided to 64ths, the other to 100ths of inches.

Sizes.....2, 4, and 9 inches.
With or without Adjusting Screw.

STEEL RULES.

GRADUATED AS DESIRED.

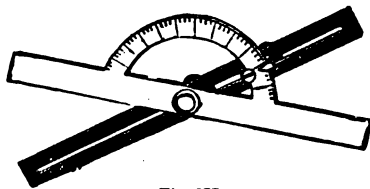
Sizes.....1, 2, 3, 4, 6, 9, 12, 18, 24, 36, 48 inches.

Steel Straight Edges.

LENGTH.	WIDTH.	THICKNESS.
6 inch.....	1 inch.....	1-10 inch.....
9 inch.....	1½ inch.....	1-10 inch.....
12 inch.....	1½ inch.....	1-10 inch.....
18 inch.....	1½ inch.....	1 inch.....
24 inch.....	2 inch.....	1 inch.....
36 inch.....	2½ inch.....	1 inch.....
48 inch.....	3 inch.....	1 inch.....

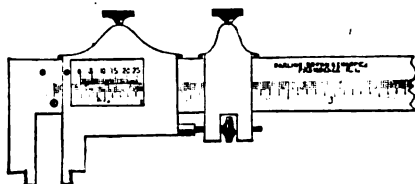
BEVEL PROTRACTOR

WITH SLIDING ARM, AND HALF CIRCLE DIVIDED TO DEGREES.



Length of Sliding Arm.....6 and 10 inches.

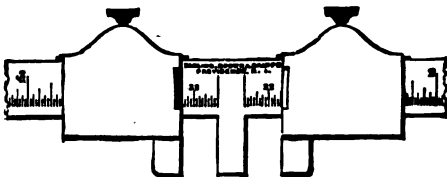
Improved Vernier Caliper..



Sizes.....6, 12, 24 inches.

Graduated to 64ths of inches, or to 20ths of millimetres.

DOUBLE CALIPERS.



Length.....7½ and 12 inches.
Will Caliper.....3¼x4½, 3¼x1½ inch.

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FOR PRICES SEE ACCOMPANYING LIST.

WIRE GAUGE AND CALIPER.

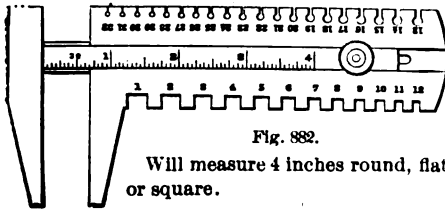


Fig. 882.

Will measure 4 inches round, flat or square.

KEY SEAT RULE.



Fig. 883.

Pocket Screw and Wire Gauge.

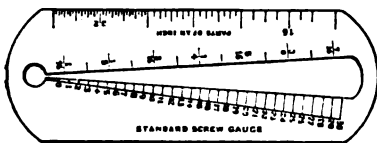


Fig. 884.

Cut one-half size.

Large Screw and Wire Gauge.

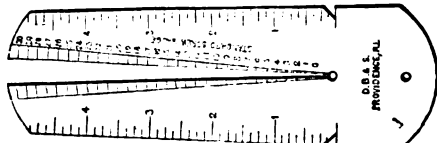


Fig. 885.

Cut one-third size.

TWIST DRILL AND STEEL WIRE GAUGE.

FOR GAUGING MORSE TWIST DRILLS AND STUBS' DRAWN STEEL WIRE.

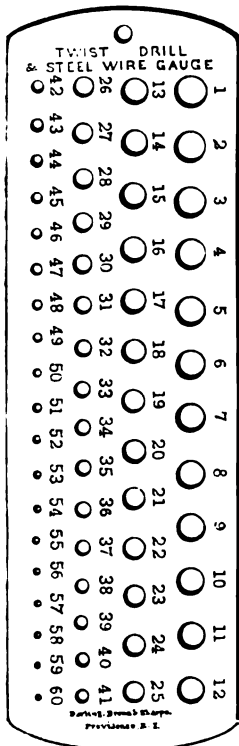


Fig. 886.

DIMENSIONS OF SIZES OF GAUGE, In decimal parts of an inch.

No.	Size of Number in Decimals.	No.	Size of Number in Decimals.
1	.227	31	.120
2	.219	32	.115
3	.212	33	.112
4	.207	34	.110
5	.204	35	.108
6	.201	36	.106
7	.199	37	.103
8	.197	38	.101
9	.194	39	.099
10	.191	40	.097
11	.188	41	.095
12	.185	42	.092
13	.183	43	.088
14	.180	44	.085
15	.178	45	.081
16	.175	46	.079
17	.172	47	.077
18	.168	48	.075
19	.164	49	.072
20	.161	50	.069
21	.157	51	.066
22	.155	52	.063
23	.153	53	.068
24	.151	54	.055
25	.148	55	.050
26	.146	56	.045
27	.143	57	.042
28	.139	58	.041
29	.134	59	.040
30	.127	60	.039

NUT AND WASHER GAUGE.

For Measuring Diameter and Thickness of nuts and washers. ONE-THIRD SIZE.

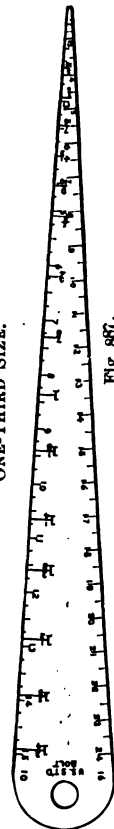


Fig. 887.

The figures upon one edge are for 16ths and 32ds, and on the other for 10ths and 20ths of inches. Also U. S. Standard sizes for holes to tap for bolts. Opposite side is graduated the same as a steel rule to 32ds of inches.

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FOR PRICES SEE ACCOMPANYING LIST.

SHEET METAL GAUGE.

(ONE-THIRD SIZE.)

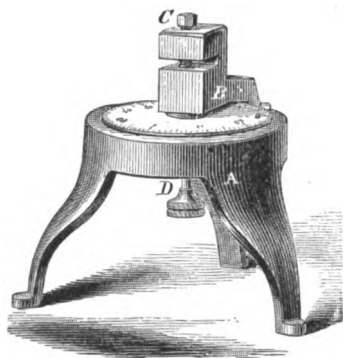


Fig. 888.

THE ENGLISH STANDARD WIRE GAUGE.

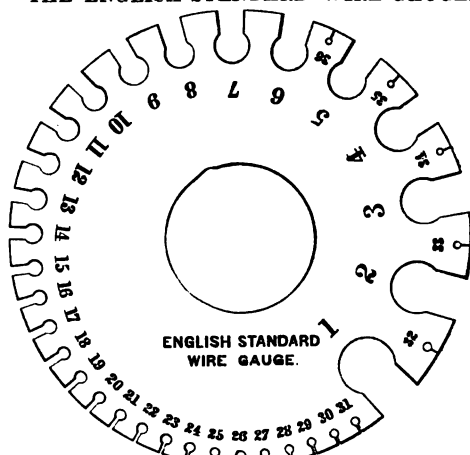


Fig. 890.

(TWO-THIRDS SIZE.)

POCKET SHEET METAL GAUGE.

(FULL SIZE.)

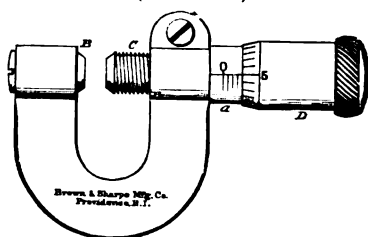


Fig. 889.

STANDARD SCREW THREAD GAUGE.

(FULL SIZE.)

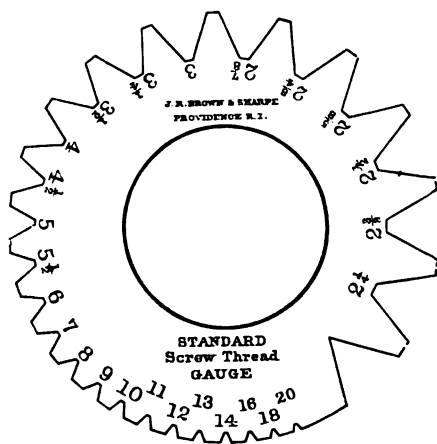


Fig. 891.

SIZES OF THE NUMBERS OF ENGLISH STANDARD WIRE GAUGE.

No. of Wire Gauge.	Size of each No. in dec. parts of an inch.	No. of Wire Gauge.	Size of each No. in dec. parts of an inch.	No. of Wire Gauge.	Size of each No. in dec. parts of an inch.
0000	.454	11	.120	25	.020
000	.425	12	.109	26	.018
00	.380	13	.095	27	.016
0	.340	14	.088	28	.014
1	.300	15	.072	29	.013
2	.284	16	.065	30	.012
3	.259	17	.058	31	.010
4	.238	18	.049	32	.009
5	.220	19	.042	33	.008
6	.203	20	.035	34	.007
7	.180	21	.032	35	.006
8	.165	22	.028	36	.004
9	.148	23	.025		
10	.134	24	.022		

THE AMERICAN STANDARD WIRE GAUGE.

Adopted by the Brass Manufacturers, Jan., 1856.

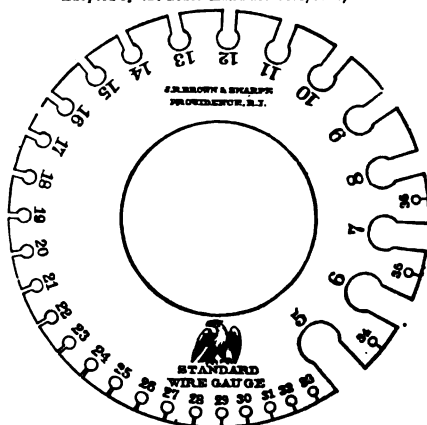


Fig. 892.

(FULL SIZE.)

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FOR PRICES SEE ACCOMPANYING LIST.

SCREW PITCH GAUGE.

FOR 16 PITCHES.—FULL SIZE.

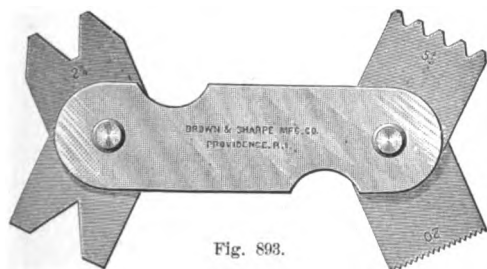


Fig. 893.



Fig. 894.

Plumb Bobs.

Bronze, with screw cap and steel point.

Bronze, without screw cap.

Iron, without screw cap.

Weight about 8 oz.

MICROMETER CALIPER

FOR MACHINISTS.

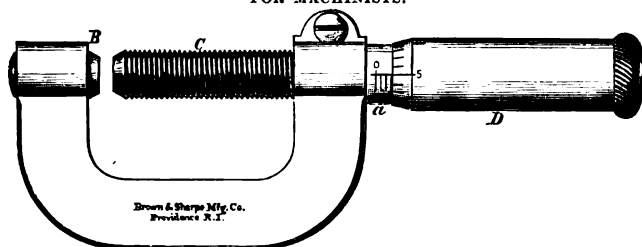


Fig. 895.

For sizes less than 1 inch. Graduated to one-thousandth of an inch.

STANDARD CALIPER GAUGES.

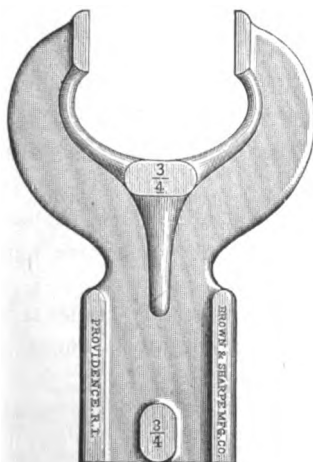


Fig. 896.

Hardened and ground. For both inside and outside calipering.

Sizes $\frac{1}{4}$ to $2\frac{1}{4}$ inches.

STANDARD CYLINDRICAL GAUGES.

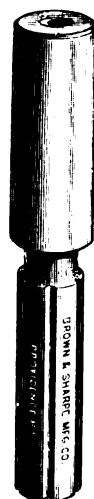


Fig. 896 1/2.

INTERNAL.

EXTERNAL.

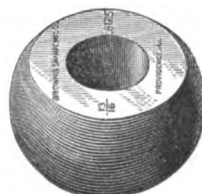


Fig. 897.

Sizes, 1-16 to 2 in.

Each set is arranged in a box, and contains sizes from one-sixteenth to two inches, varying by sixteenths of inches. Special sizes made to order.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

WARRANTED CAST STEEL, HAND-CUT
FILES,
 OF EVERY SIZE, SHAPE AND CUT, ALWAYS IN STOCK.

(See Price List.)

EMERY WHEELS
 OF EVERY SIZE, SHAPE AND GRADE, ALWAYS IN STOCK.

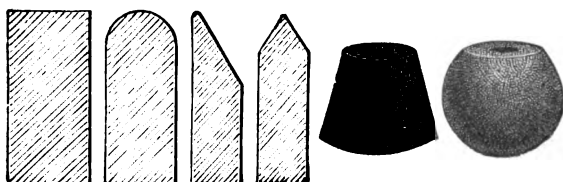


Fig. 898. Fig. 899. Fig. 900. Fig. 901. Fig. 902. Fig. 903.

CLASSIFICATION.

CLASS "A" is a hard wheel made of the *coarsest* grades of emery, running from No. 8 to No. 14, and is suitable for *edge* work on chilled iron or steel plows, cutting off sprues and gates from heavy castings and general rough work.

CLASS "B" is also a hard, durable wheel, made of emery running from No. 16 to No. 24, and is suitable for all kinds of *edge* work where coarser grades are not required. Also, suitable for saw gumming, shaping moulding bits, brass work, etc.

CLASS "C" is a softer wheel than either "A" or "B," and is made of the medium grades of emery running from No. 20 to No. 40. The wheel will do a greater variety of work than any other class, and is well adapted to machine shop use, grinding tools and general work.

CLASS "D" is a *hard* fine wheel, made of all the finer grades of emery running from No. 40 to No. 90, and is suitable for fine *edgework*, light grinding on tools, sharpening molding bits, saws, etc.

CLASS "E" is a *soft* fine wheel, made of all the finer grades of emery running from No. 40 to 90, and is suitable for grinding edge tools, finishing fine surfaces and general fine work.

X after a letter indicates a *very hard* wheel, as B^x for edgework on stoves, safes, etc.

S indicates a very soft wheel, as A^s for surface work on plows, and C^s for surface work on cast iron, steel, etc.

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 FOR PRICES SEE ACCOMPANYING LIST.

DIAMOND TURNING TOOLS.

FOR TRUEING EMERY WHEELS.



Fig. 904.



Fig. 905.

EMERY WHEEL TRUEING MACHINE.

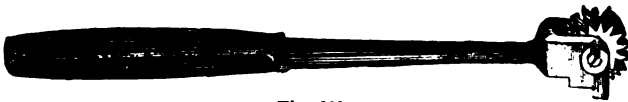


Fig. 906.

Either with or without diamond.

EMERY GRINDERS.

No. 1.

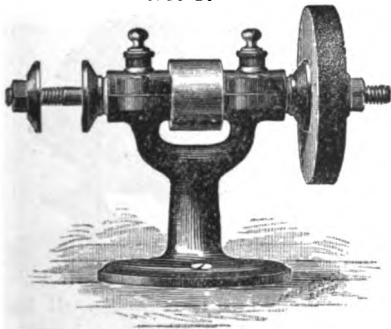


Fig. 908.

DIMENSIONS.

No.	Diam. of Wheels it is suited for.	Diam. of Spindle.	Weight.
1	6 inches.	$\frac{1}{2}$ inch.	14 lbs.
2	6 "	$\frac{1}{2}$ "	16 "
3	9 "	$\frac{3}{4}$ "	35 "

No. 2 is same as No. 1, but has two rests.

Millstone Rubber.



Fig. 907.

With or without Handle.

No. 3.

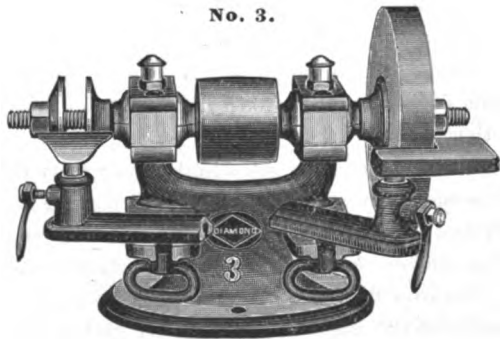


Fig. 909.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

EMERY GRINDER, No. 6.

WITH SURFACE TABLE ATTACHMENT OVER THE WHEEL.

PEDESTAL OR STAND

FOR

Nos. 1, 2 and 3 GRINDERS.

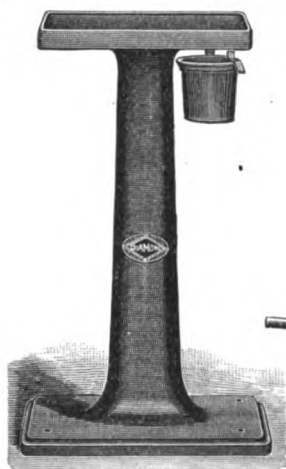


Fig. 910.

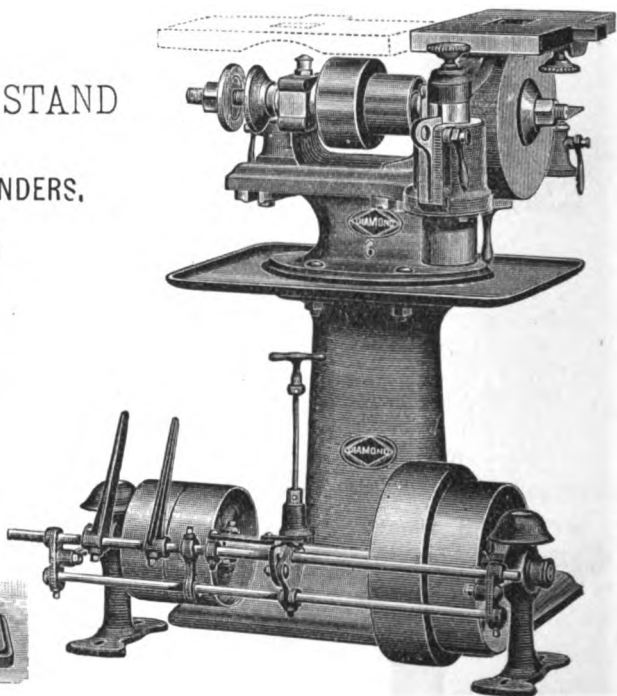


Fig. 911.

The Machine shown above is the regular Pattern of No. 6 Grinder. It has fastened to the arm, projecting from the back of the machine, a NEW DESIGN (Patent applied for) of Table Attachment for doing surface work with facility. Adapted to grinding Dies and any work required to be ground straight. A certain class of work done upon the Planer, Milling Machine, or with Files, can be placed upon this Tool where it can be done more quickly and at much less expense than by any other method.

The Attachment will admit of using any thickness of Emery Wheel from $\frac{1}{2}$ to 3 inches by an arrangement of ours, leaving no open space either side of the Wheel. It does not interfere with the operator's use of the rests on the front of the machine. The machine is designed to use wheels 16 inches in diameter.

The Iron Table has CORRUGATED SURFACE, into which the emery dust falls, and is led from the machine. This device giving a clear surface, free from dust.

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FOR PRICES SEE ACCOMPANYING LIST.

EMERY GRINDERS.

STYLE OF Nos. 4 and 5.

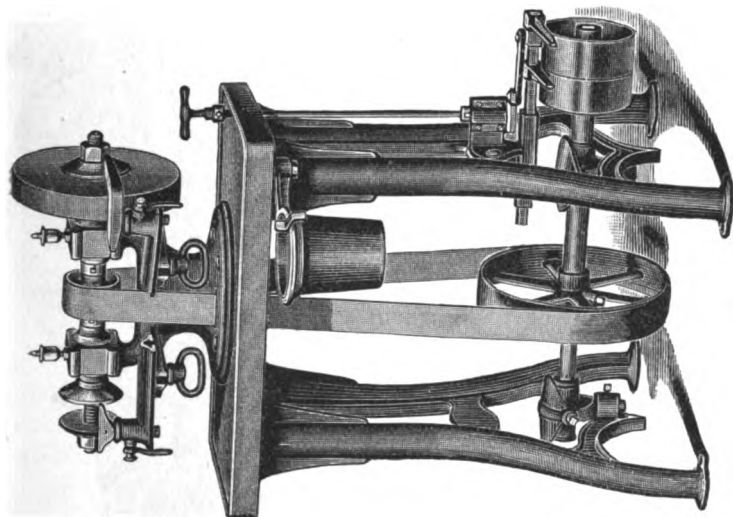


Fig. 913.
DIMENSIONS.

No.	Diam. of Wheel suitable for	Diam. of Spindle.	Weight.
4	12 inches.	$1\frac{1}{8}$ inch.	285 lbs.
No. 5 is same as No. 4, except that it has rests both on the front and back.			

STYLE OF Nos. 6 and 7.

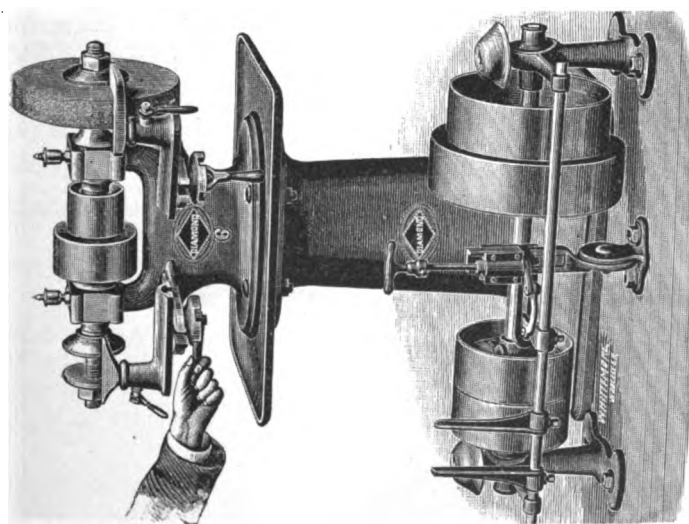


Fig. 912.

DIMENSIONS.

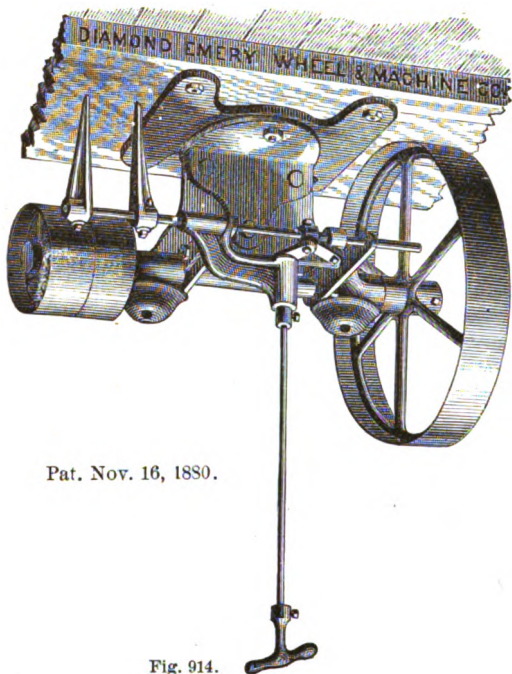
No.	Size of Wheel suitable for	Size of Mandrel.	Weight.
6	16 inches.	$1\frac{1}{4}$ inch.	400 lbs.
7	20 "	$1\frac{3}{4}$ "	550 "

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COUNTERSHAFTS FOR EMERY GRINDERS.

Style used for Nos. 1 to 6, with patent belt shifter.



Pat. Nov. 16, 1880.

Fig. 914.

Style used for No. 7, with patent belt shifter.

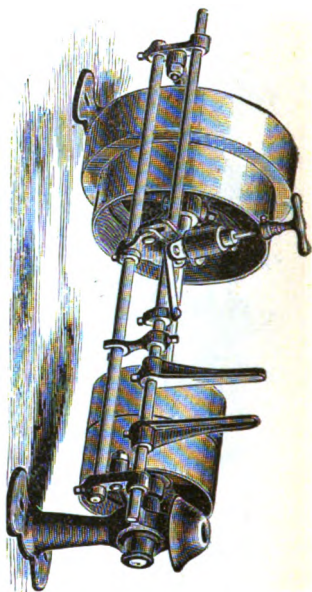


Fig. 915.

POLISHING AND BUFFING LATHES.

Style of
Nos. 1 and 2.

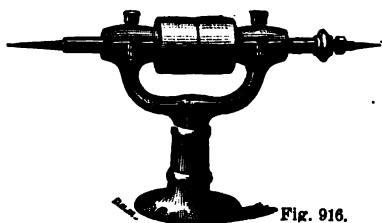


Fig. 916.

DIMENSIONS.

No.	Height.	Diam. of Spindle.	Length of Spindle.
1	7½ inch.	¾ inch.	17½ in.
2	12 "	1½ "	33 "
3	12 "	1 "	45 "

Countershafts furnished if desired

STYLE OF NO. 3.

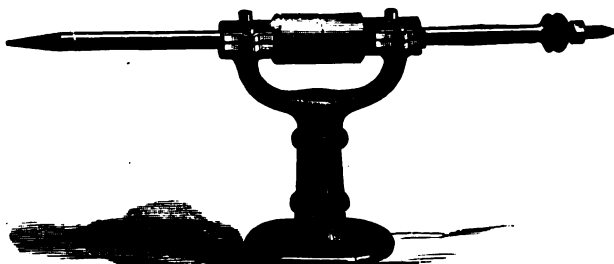


Fig. 917.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Muslin, Flannel and Woolen Buffs.

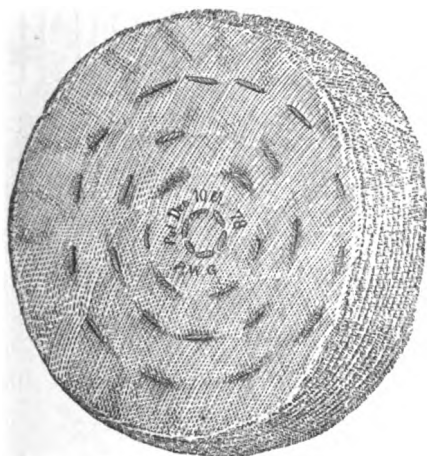


Fig. 918.

Size.....2 to 12 in. diam.

Bristle and Tampico Wheel Brushes.

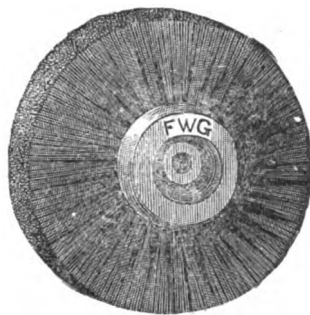


Fig. 919.

Rows.....7, 4 and 2.

Walrus Leather—for Polishing all kinds of Metal.

WALRUS LEATHER WHEELS.



Fig. 920.

Size.....20 inches diam.

" 4 " thick.



Fig. 921.

Size.....9 inches large diam.

" 7 " small "

" 4½ " thick.

SEA LION LEATHER,

SELECTED BULL NECK,

OAK AND HEMLOCK LEATHER,

FINE WOOL FELT FOR BUFF WHEELS.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PATENTED AND IMPROVED
AUTOMATIC KNIFE GRINDER,
FOR ALL KINDS OF LONG KNIVES.

WITH PATENT SLIDING BOXES SO THAT THE WHEEL CAN BE
ENTIRELY USED UP.

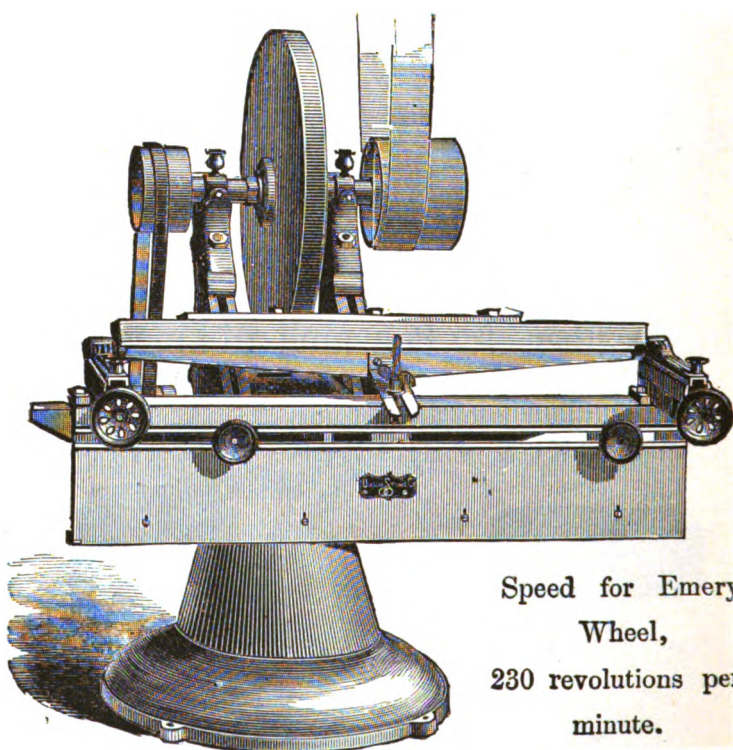


Fig. 922.

Speed for Emery
Wheel,
230 revolutions per
minute.

The Grinding Wheel in each is 26 inches in diameter.
The price includes the wheel.

SIZES OF MACHINES.

To grind knives 24, 36, 50, 60 or 80 inches in length.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

GRINDSTONE FRAMES.

WOOD FRAME.



Fig. 922.

No.	Weight.	Diameter.
1	50 lbs.	18 inch.
2	60 "	20 "
3	70 "	21 "
4	80 "	22 "
5	90 "	23 "
6	100 "	24 "
7	110 "	25 "
8	120 "	26 "
9	130 "	27 "
10	140 "	28 "
11	150 "	29 "
12	200 "	30 "
13	300 "	36 "

SHIP GRINDSTONES.

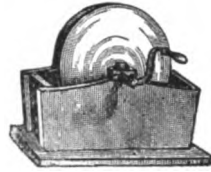


Fig. 924.

No.	1	2	3	4
Diameter..	12	14	17	18

HOPPEN'S CAST IRON GRINDSTONE FRAME.

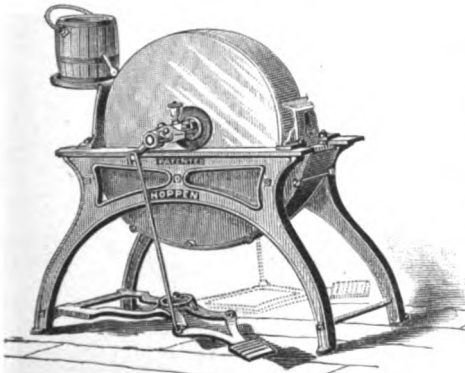


Fig. 925.

Frame may be built any width. Water trough, shield and tool rest, all adjustable. Tool rest has drippan which drains into the trough. The journal boxes have metal oilers screwed into the caps. The mechanical construction of these frames, involves neat appearance, and lightness, with great strength and durability. The foot power frame has swivel treadle for right or left foot.

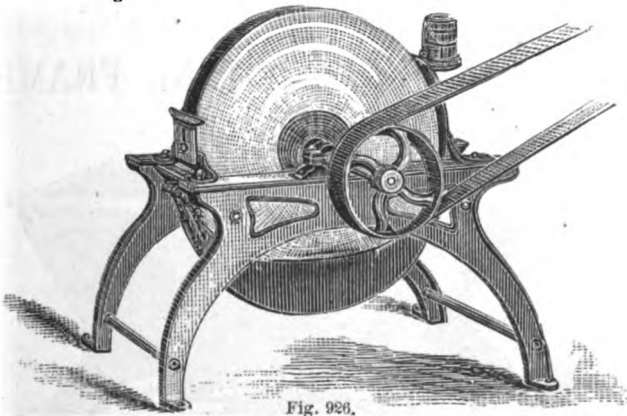


Fig. 926.

LIST OF SIZES.

No. 0A, with Trough, Tool Rest, and Pulley, Stone.....	24 x 2 1/2
" 0B, " " " Treadle, "	24 x 2 1/2
" 0C, " " " Pulley & Treadle "	24 x 3 1/4
" 1, " " " Pulley, "	24 x 3
" 2, " " " Pulley, "	27 x 3 1/4
" 3, " " " Pulley, "	30 x 4
" 4, " " " Pulley, "	36 x 5 to 6

Shield, Pan, Bucket and Faucet extra.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Patent Cast Iron Grindstone Frame.

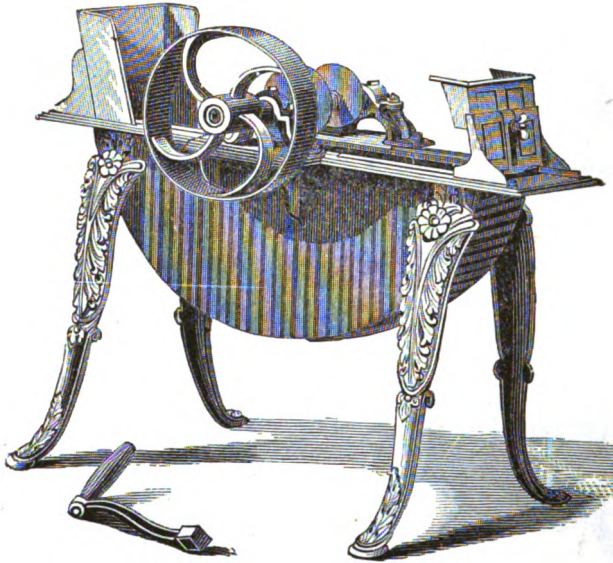


Fig. 927.

- | | | |
|--------|-----------------------------------|---------------|
| No. 1. | With crank and treadle, for stone | 30 x 4½ inch. |
| " 2. | With treadle and pulley, | " 30 x 4½ " |
| " 3. | With pulley only, | " 30 x 4½ " |
| " 4. | " " " " | " 48 x 6 " |

NEW STYLE GRINDSTONE FRAME.

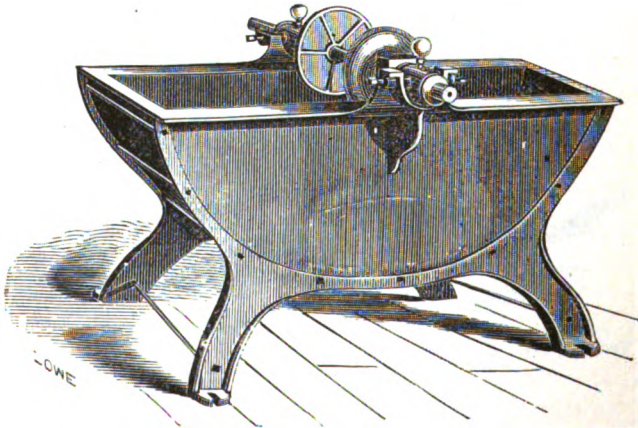


Fig. 928.

With pulley only for stone 30 x 4 inch, 42 x 5 inch, or 54 x 8 inch. Stones extra.

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FOR PRICES SEE ACCOMPANYING LIST.

GRINDSTONE FIXTURES.

Set of Fixtures for Hand or Foot.

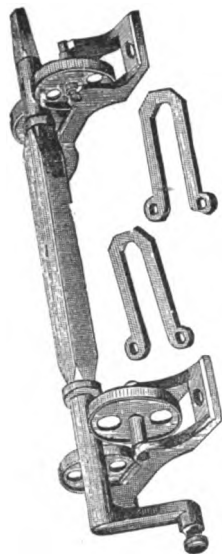


Fig. 929.

SIZES.

Number.....	9	8	7
Length of Shaft.....	15,	18,	24 inches.

Set of Fixtures, with Flanges, for Hand or Foot

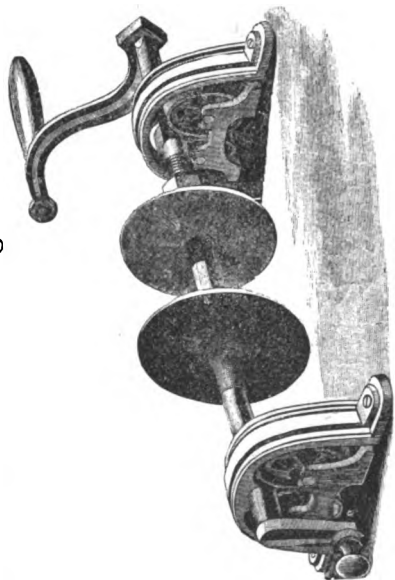


Fig. 930.

Set of Fixtures, with 12x3 in. Pulley, for Power,
 FOR STONE 4 INCHES THICK.

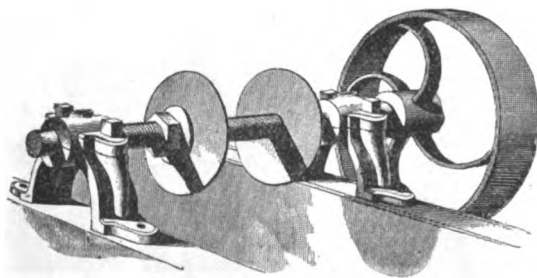


Fig. 931.

SIZES.

Number.....	1	2	3	4
Length of Shaft.....	15¼,	18,	24,	30 inches.

*Newcastle, Ohio, Berea and other grades of Grindstones at
 Market Prices.*

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

WROUGHT IRON PULLEY BLOCKS.

FOR ROPE OR CHAIN.



Fig. 932.
For rope, $\frac{1}{2}$ $\frac{3}{4}$ 1 $1\frac{1}{2}$ $1\frac{3}{4}$ 2 $2\frac{1}{2}$ and $2\frac{3}{4}$ inch diam.

GALVANIZED MALLEABLE IRON TACKLE BLOCKS.

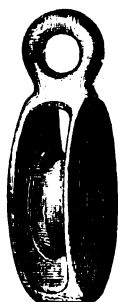


Fig. 934.



Fig. 935.



Fig. 936.

For rope, $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ and $\frac{3}{4}$ inch diameter.

COMMON OR PATENT SHEAVES.

WOODEN ROPE BLOCKS.

Rope Strapped.

Inside Iron Strapped.



Fig. 937.



Fig. 938.



Fig. 939.

SNATCH BLOCK.

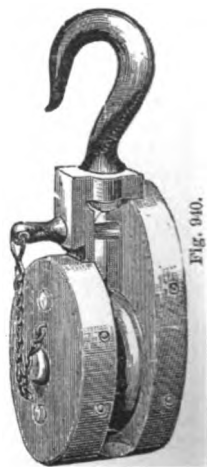


Fig. 940.

Length of Block, 8 $8\frac{1}{2}$ 4 5 6 7 8 9 10 11 12 13 14 inches.
Size of Rope, $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 1 $1\frac{1}{2}$ $1\frac{3}{4}$ 2 2 $2\frac{1}{2}$ "
Figs. 938, 939 are also made 15 and 16 in. Fig. 940 is made 16, 18 and 20 inch.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Self-Sustaining Rope Blocks.
WROUGHT IRON.

Champion Self-Sustaining Rope Block.

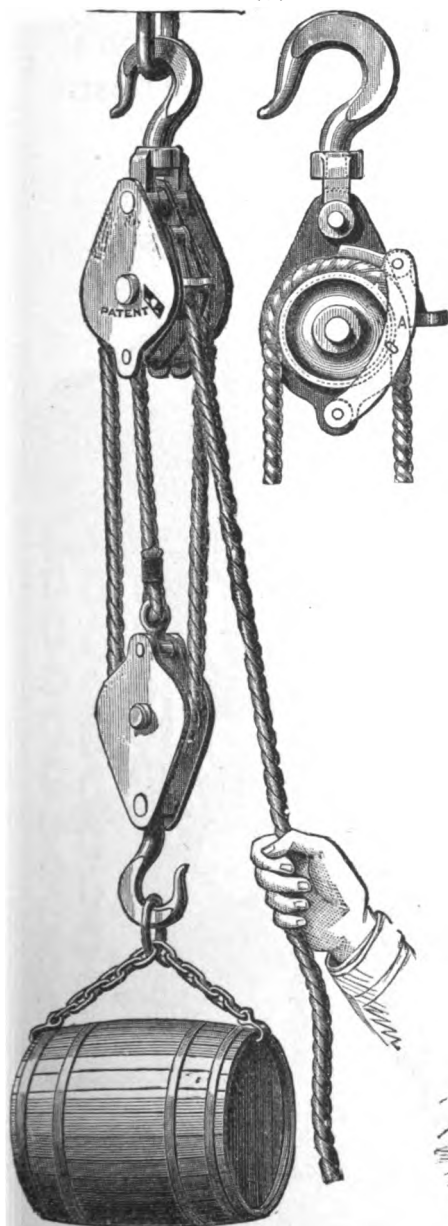


Fig. 941.

Either Style for Rope..... $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{7}{8}$ 1 inch.
Each Sheave will Lift..... 1 3 5 7 10 11 hundred pounds.



Fig. 942.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Weston's Differential Blocks.

DIRECT BLOCK.

GEARED BLOCK.

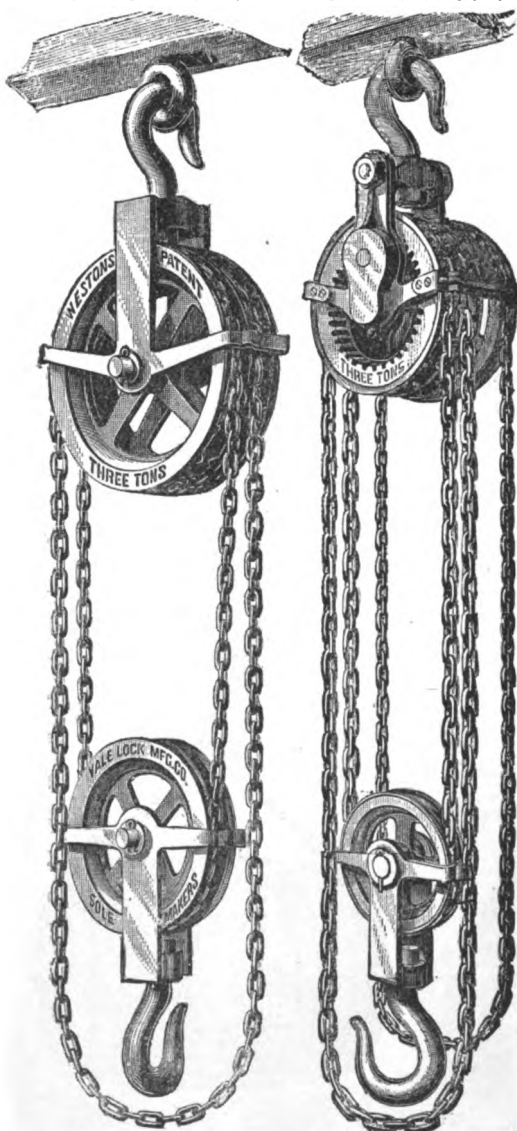


Fig. 943.

Fig. 944.

Capacity.	Height of lift.	Capacity.	Height of lift.
$\frac{1}{2}$ ton.	5 feet.	1 ton.	8 feet.
$\frac{3}{4}$ "	6 "	2 "	9 "
$\frac{1}{2}$ "	7 "	3 "	10 "
1 "	8 "	4 "	11 "
$1\frac{1}{4}$ "	$8\frac{1}{2}$ "	5 "	12 "
2 "	9 "	6 "	13 "
3 "	$9\frac{1}{2}$ "	8 "	14 "
		10 "	16 "

Harrington's Screw Hoist.

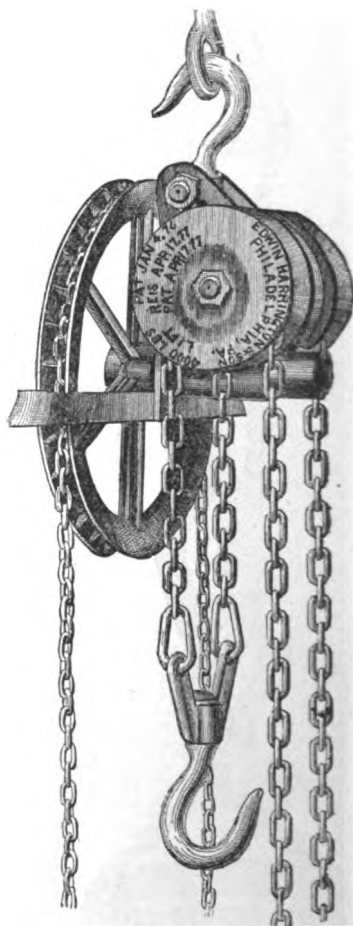


Fig. 945.

Capacity.	Height of lift.
$\frac{1}{2}$ ton.	8 feet.
$\frac{3}{4}$ "	8 "
1 "	8 "
$1\frac{1}{4}$ "	9 "
2 "	10 "
3 "	10 "
4 "	10 "
5 "	12 "
6 "	12 "
8 "	12 "
10 "	12 "

Eades' Differential Pulley Blocks.

No. 1.

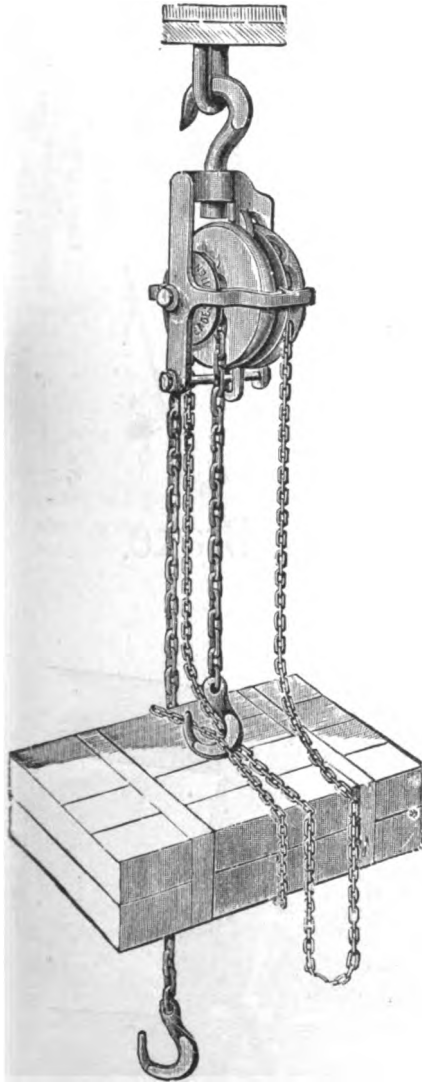


Fig. 946.

No. 3.

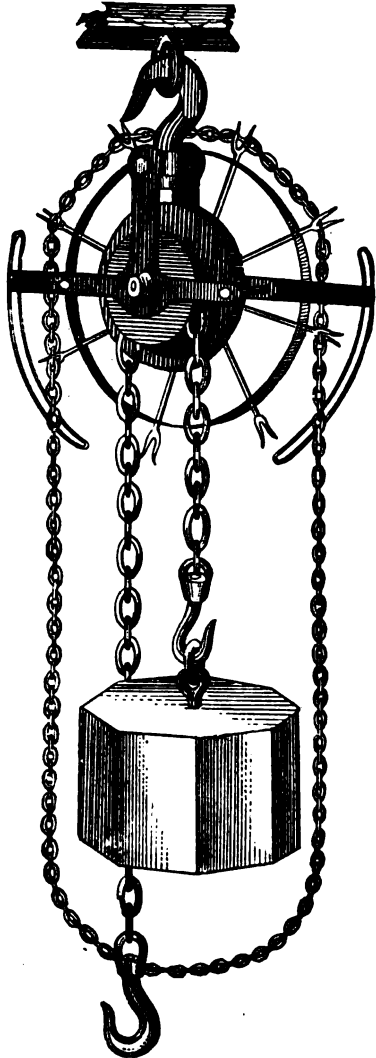


Fig. 947.

SIZES.

Capacity, tons.....	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	3	4	5	6	8	10
Height of lift, feet.....	7	7	8	9	10	10	11	12	13	14	16
Weight of block, lbs.....	23	23	45	70	103	163	210				

No. 1 is not made larger than 4 tons. No. 3 is not made smaller than 3 tons.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HOISTING CRAB, WITH SAFETY BRAKE.

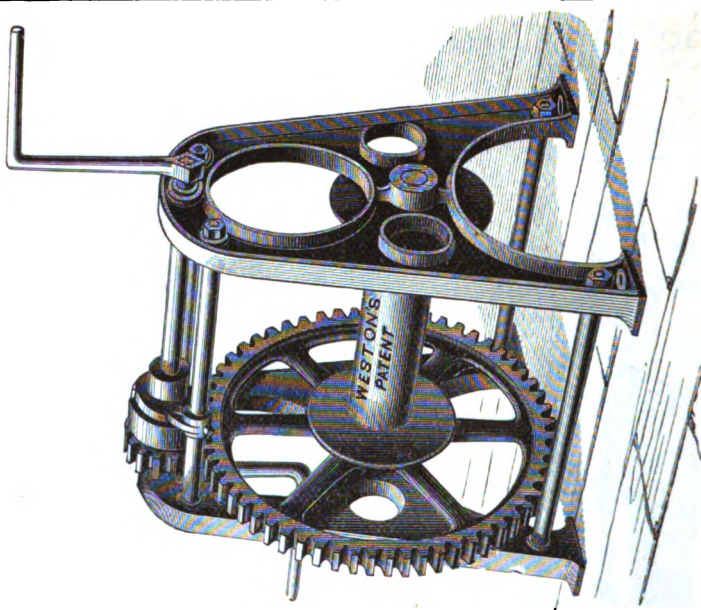


Fig. 949.		
No.	Length of Bbl.	Capacity.
1.....	11 inches ..	$\frac{1}{2}$ ton.
2.....	17 " ..	$1\frac{1}{2}$ "

Derrick Winch, Safety Brake.

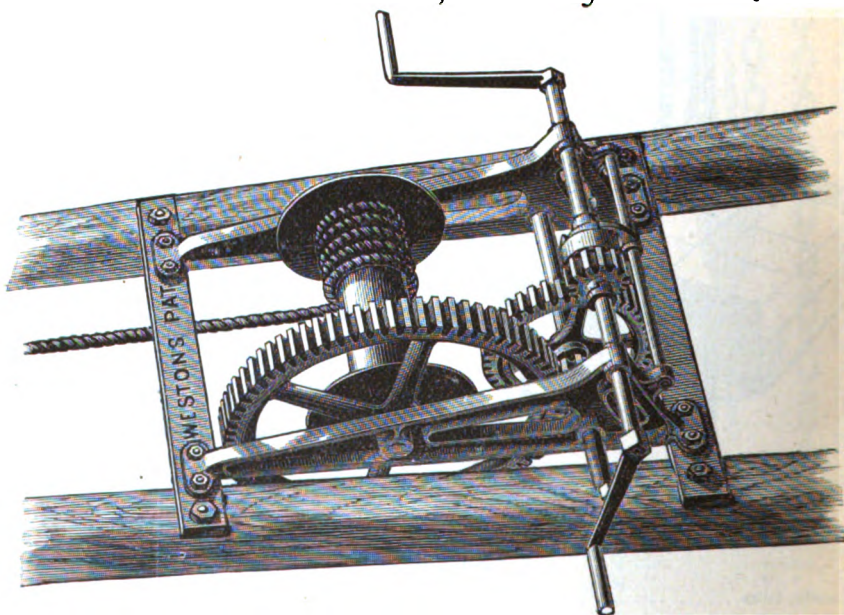


Fig. 948.

Same Capacity as the Hoisting Crab.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

Best quality of *Manilla Rope*.

Grooved Wheels, for transmission of power by ropes.

Iron and Steel Wire Ropes, for hoist, guy, derrick and rigging ropes.
Also *Galvanized Iron Wire Rope*. (See Price List.)



Fig. 950.

DOCK BLOCK.

With universal ball and socket joint, permitting the block to swing easily in direction of fall.

No. 1..... 7 inch sheave, 1 inch face, for 3 inch rope
No. 2..... 10 " 1½ " " 4½ "

COALING TUBS.

HORSE POWER.

With Side or Top Lock.

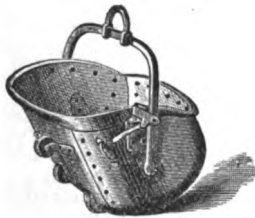


Fig. 951.

Capacity in Tons.

No. 1, ½ ton.
No. 2, ¾ "
No. 3, 1 "
No. 4, 1½ "

STEAM POWER.

With Side or Top Lock.



Fig. 952.

Capacity in Lbs.

No. 5, 400 lbs.
No. 6, 500 "
No. 7, 600 "
No. 8, 700 "
No. 9, 800 "
No. 10, 900 "
No. 11, 1,000 "
No. 12, 2,000 "

Paper Water Pail.



Fig. 953.

GALVANIZED IRON Water Pails.



Fig. 954.

Capacity in Quarts.

No. 1, 10 quarts.
No. 2, 12 "
No. 3, 16 "

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

RUBBER MACHINE BELTING.

This Belting is made of Heavy Cotton Duck, weighing two pounds per yard, woven expressly for the purpose, coated with the best of India Rubber.

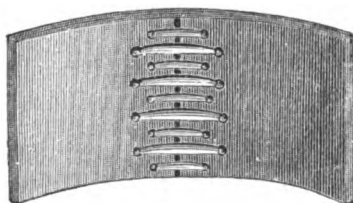


Fig. 955.

SIZES.

2 ply.....	1 to 24 inches wide.
3 ply.....	2 to 28 inches wide.
4 ply.....	2 to 48 inches wide.
5 ply.....	8 to 48 inches wide.
6 ply.....	8 to 48 inches wide.

ENDLESS BELTS

Made to order, for which THREE EXTRA FEET will be charged for the SPLICE, and TEN PER CENT. additional on the *net* price of the whole belt; also RAILWAY BELTS or APRONS, for Cotton Mills, of the best quality of India Rubber on Cotton Duck.

BEST OAK TANNED LEATHER BELTING.

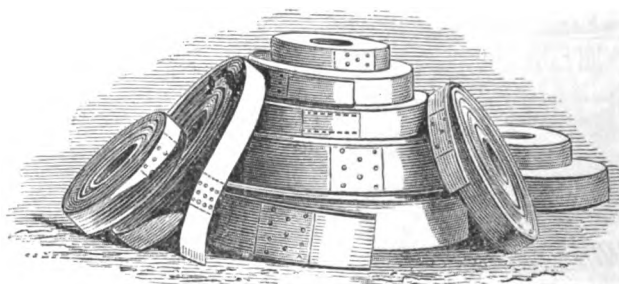


Fig. 956.

Flat—Single and Double. Round and Square—Solid. Round Twisted.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

BELT FIXTURES.

*Rawhide Lace Leather. Tanned Lace Leather.
Copper Rivets and Burrs.*

COMMON BELT HOOKS.

BLAKE'S BELT STUDS.

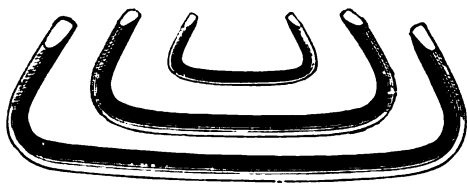


Fig. 957.

Nos. 15 to

ROUND STEEL BELT COUPLINGS.

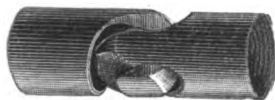


Fig. 958.

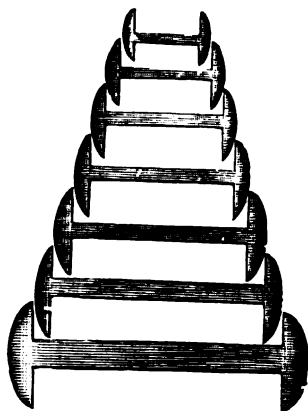
Sizes, $\frac{1}{4}$ to $1\frac{1}{4}$ inch.

Fig. 959.

Nos. 6 to 00.

The WHITING STRONGHOLD BELT CLASP.

(Patented Sept. 21st, 1880.)

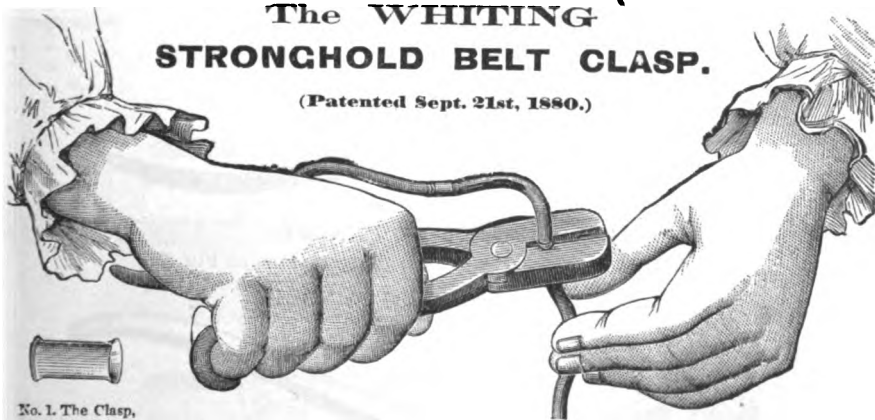
No. 1. The Clasp,
for 1-3 in. belt.No. 2.
Belt ends compressed
ready for inserting in clasp.
For 3-16 in. Belt.No. 3.
Clasp with ends
of belt inserted.
For 1-4 in. Belt.No. 4.
Clasp after being
compressed with pincers,
For 3-16 in. Belt.No. 5.
Sectional view of
leather belt and clasp.
For 3-8 in. Belt.

Fig. 960.

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FOR PRICES SEE ACCOMPANYING LIST.

BELT FIXTURES.**RIVET SET.**

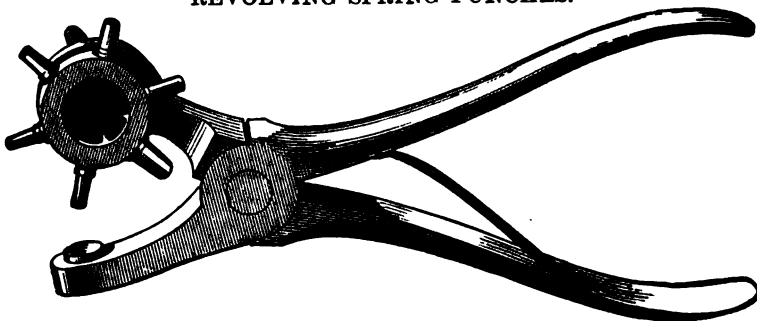
Fig. 960½.

ROUND BELT PUNCH—STEEL.Fig. 961.
Nos. 1 to 16.**OVAL BELT PUNCHES—STEEL.**Fig. 962.
Nos. 1 to 16.**LARGE ROUND PUNCHES.**

Fig. 963.

Sizes, $\frac{1}{4}$ to 1 inch single; $1\frac{1}{2}$ to 3 inch double.**CAST SPRING PUNCHES, JAPANNED HANDLES.**Fig. 964.
6 and 8 inch.**POLISHED SPRING PUNCHES.**

Nos. 000 to 10, with screw tubes; pattern same as Fig. 964.

REVOLVING SPRING PUNCHES.Fig. 965.
4 or 6 tubes.**22 CORTLANDT STREET, NEW YORK.****FOR PRICES SEE ACCOMPANYING LIST.**

BELT FIXTURES.

HAND PUNCH—CAST STEEL.

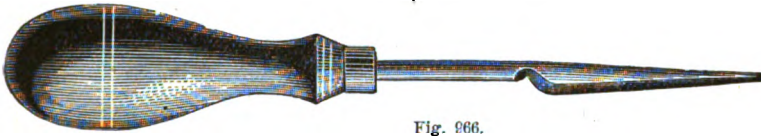


Fig. 966.

BELT AWL—CAST STEEL

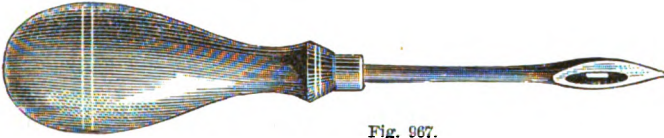


Fig. 967.

ELLIOT'S "1880" LACE CUTTER.

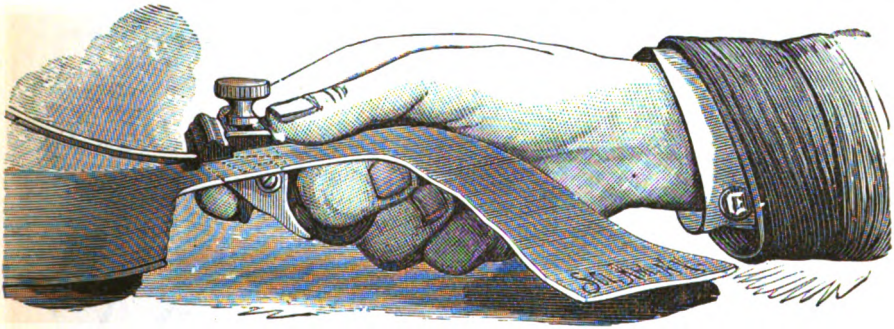


Fig. 968.

THE PORTER BELT TIGHTENER.

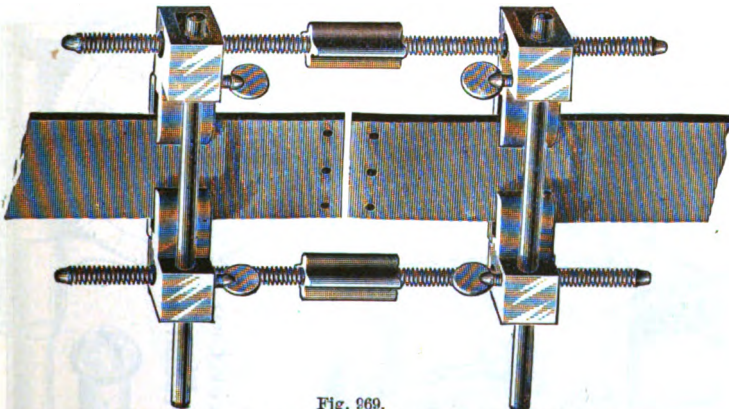


Fig. 969.

Only one size is made, for belts from 2 to 20 inches.

The right and left hand screws, by the operation of which the belt is drawn together, are of sufficient length to allow the clamps to be placed at such a distance from the ends of the belt as to leave ample room for lacing, or for applying a square to the ends if desired.

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FOR PRICES SEE ACCOMPANYING LIST.

GEARED BELT CLAMP.

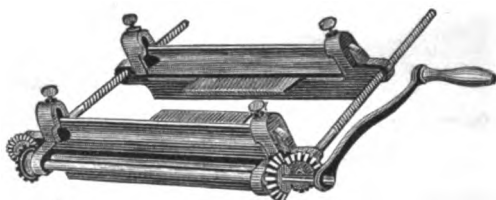


Fig. 970

Regular Sizes —Figs. 8, 12, 16, 20, 24, 28, 32 and 36 inches.

IMPROVED ROPE BELT CLAMPS.

Regular Sizes, 6 to 24 inches.

Schofield's Patent Shafting Straighteners.

No. 1, 1½ inch. No. 2, 2 inch. No. 3, 2½ inch.

New Haven
Shafting Straightener.

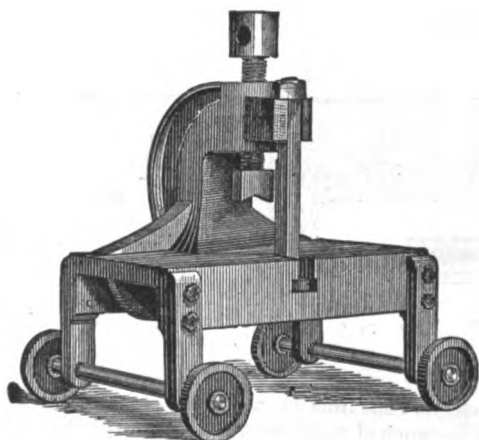
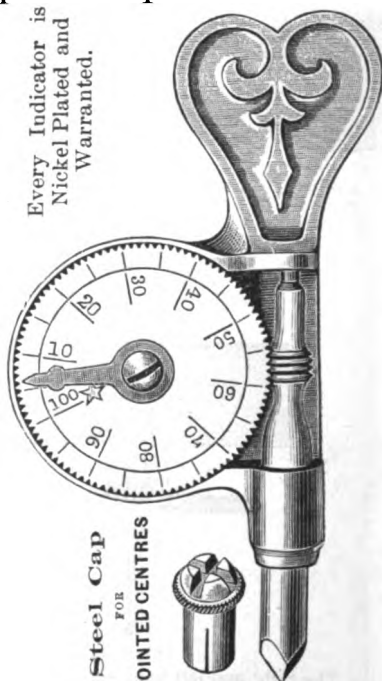


Fig. 971.

Improved Speed Indicator.

Every Indicator is
Nickel Plated and
Warranted.



Steel Cap
FOR
POINTED CENTRES

Fig. 971½.

With or without steel cap.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Shafting, Pulleys, Hangers, Etc.

BALANCED PULLEYS.

SINGLE ARM.

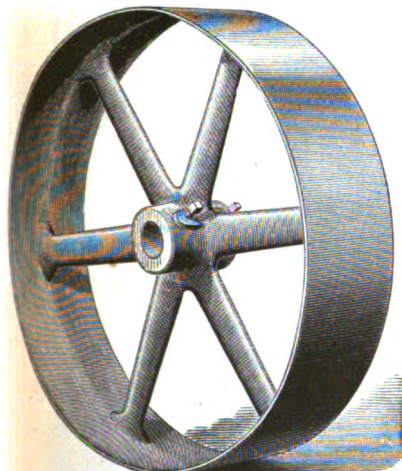


Fig. 972.

DOUBLE ARM.

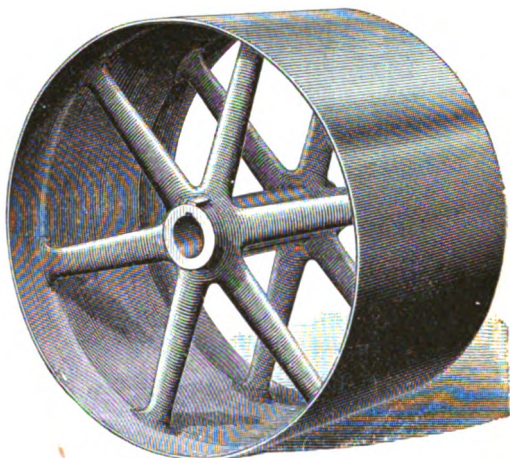


Fig. 973.

Any desired size. Loose Pulleys, with extra long hub, are furnished when desired.

SPLIT OR HALVED PULLEYS.

TURNED OR COLD ROLLED
SHAFTING.

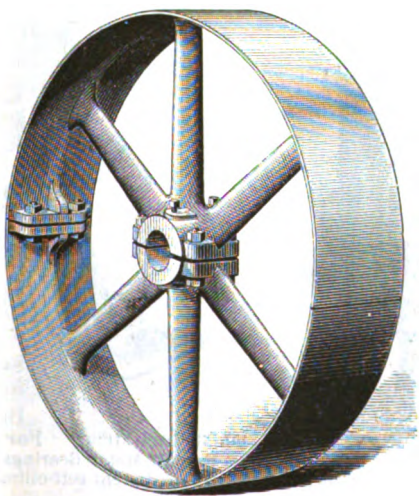


Fig. 974.

MEDART'S
PATENT WROUGHT RIM PULLEYS.
(Prices same as Turned Pulleys.)

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PLAIN HANGER.

Fig. 975.

6, 9, 12, 15, 18, 21 inch drop.
For any size of shaft.

Double Braced Adjustable Hanger.

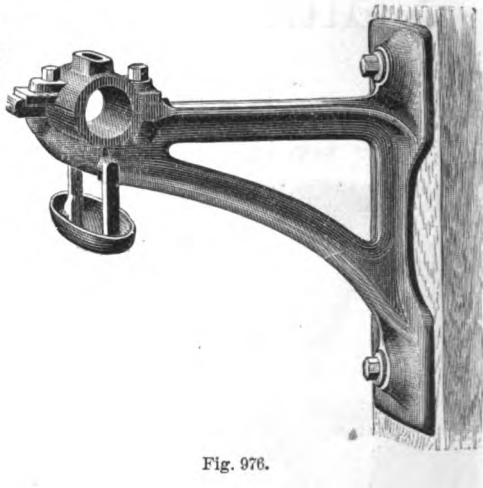
BRACKET HANGER.

Fig. 976.

12, 15, 18 inch drop.
For any size of shaft.

Double Braced Adjustable Floor Stand.

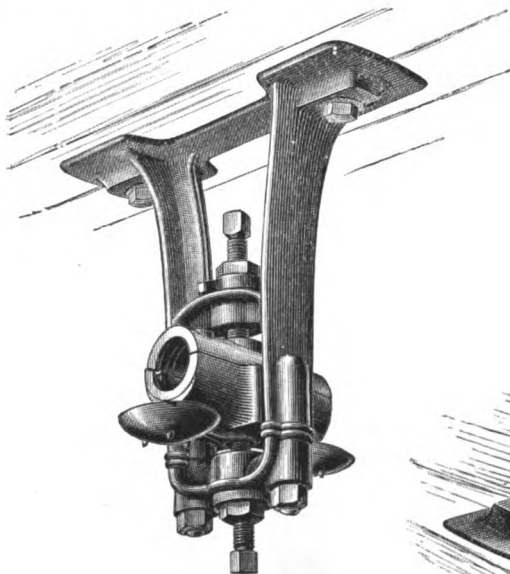


Fig. 977.

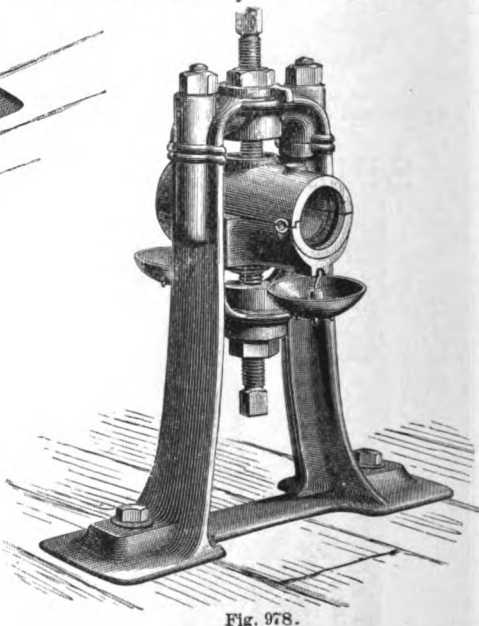


Fig. 978.

6, 7½, 9, 12, 15, 18, 21, 24, 27, 30, 36 inch drop. For any size shaft.

All Hangers have Babbitt Metal Bearings.

Our Adjustable Hangers, shown above, have a patent self-oiling arrangement, allowing them to run a long time without attention.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

ADJUSTABLE SWIVEL HANGER.

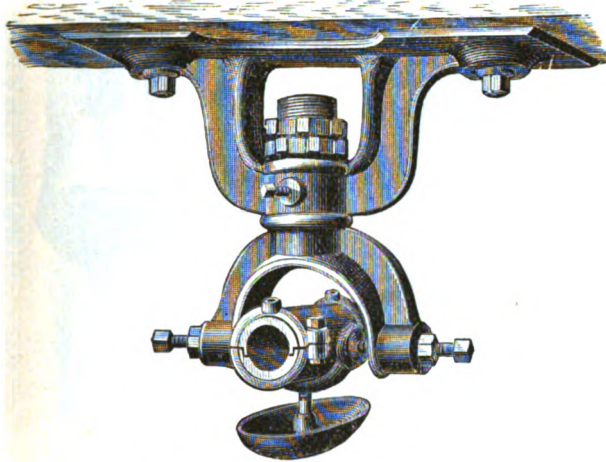


Fig. 979.

8, 9, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32 inch drop.

ADJUSTABLE POST STAND.

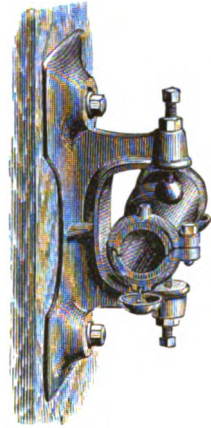


Fig. 981.

ADJUSTABLE SWIVEL POST HANGER.

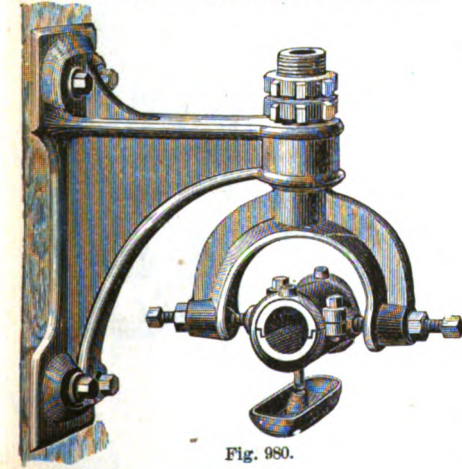


Fig. 980.

9, 12, 15, 18 inch drop.

ADJUSTABLE LOW-DROP HANGER.

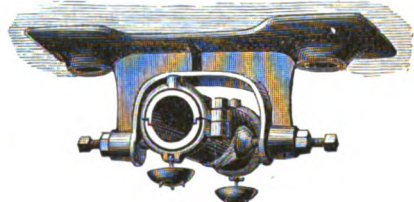


Fig. 982.

Adjustable Low-drop Floor Stand.

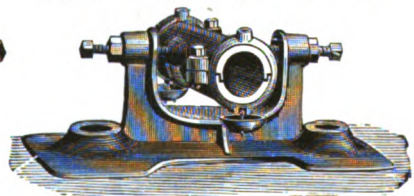


Fig. 983.

JOURNAL BOX.



Fig. 984.

PILLOW BLOCK.

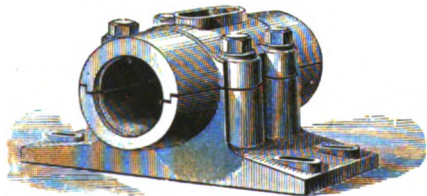


Fig. 985.

All of above for any size of shaft, and with Babbitt metal bearings.

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FOR PRICES SEE ACCOMPANYING LIST.

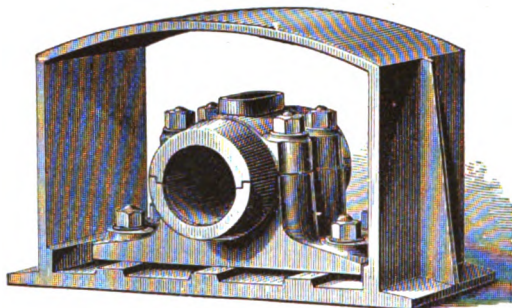
WALL FRAME AND PILLOW BLOCK.**BABBITT BEARINGS.**

Fig. 986.

**FLANGE-FACED COUPLING,
WITH BOLTS.**

Fig. 988.

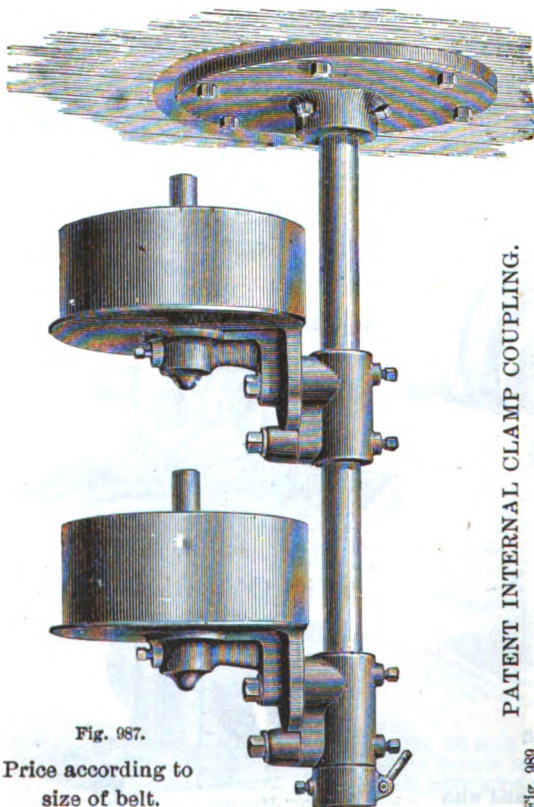
MULE PULLEY STAND.

Fig. 987.

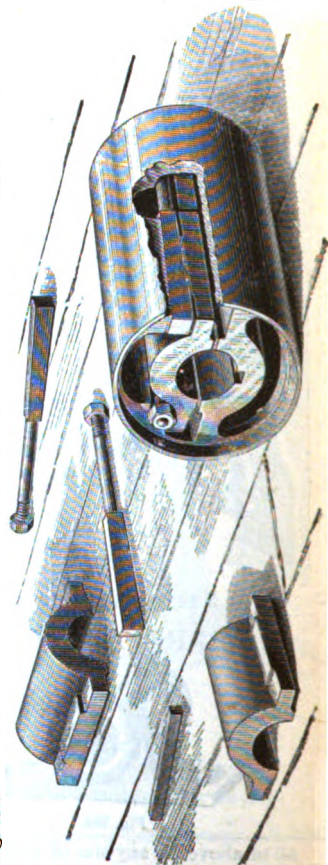
Price according to
size of belt.**PATENT INTERNAL CLAMP COUPLING.**

Fig. 989.

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FOR PRICES SEE ACCOMPANYING LIST.

BINDER FRAME.

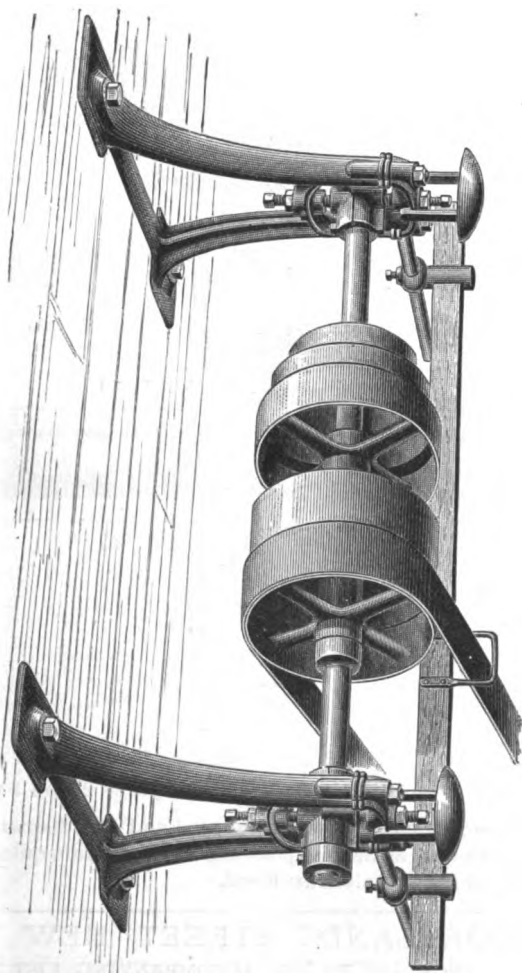
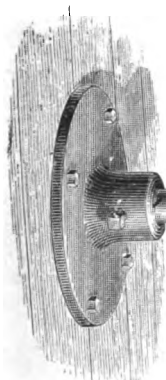


Fig. 991.

Special Prices upon application.

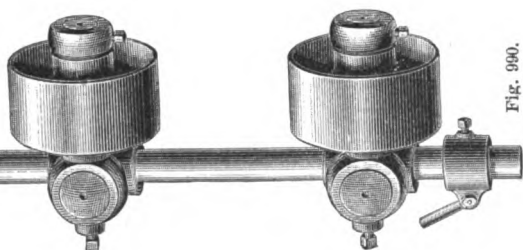


Fig. 990.

Price according to size of belt.

22 CORTLANDT STREET, NEW YORK.

BROWN'S Improved Friction Clutch Coupling.

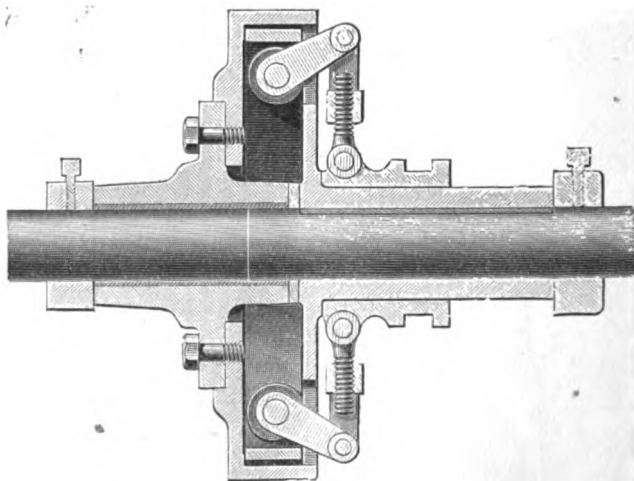
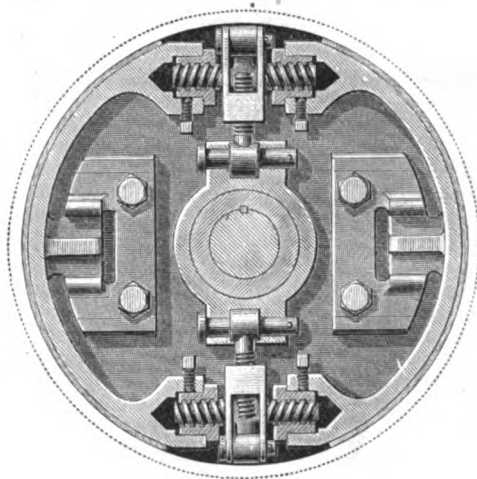


Fig. 992.

Diam. of Clutch,	12	15	18	21	24	27	30	33	36
" of Shaft,	$1\frac{1}{2}$ to $1\frac{3}{4}$	$1\frac{1}{2}$ to 2	$1\frac{3}{4}$ to $2\frac{1}{4}$	2 to $2\frac{1}{4}$	$2\frac{1}{4}$ to $3\frac{1}{4}$	$2\frac{3}{4}$ to 4	3 to 4	$3\frac{1}{2}$ to $4\frac{1}{2}$	$3\frac{1}{2}$ to 5.

In ordering be particular to state the speed and the diameter of the shaft, the number of horse-power, as near as possible, and if to start quick or gradually.

Friction Clutch Pulleys also furnished.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

MILL GEARING OF EVERY DESCRIPTION.

SPUR GEARING.

SPUR MORTISE WHEELS.

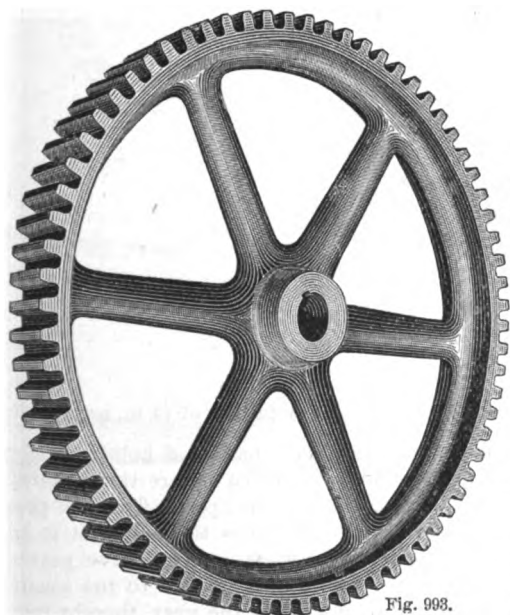


Fig. 903.

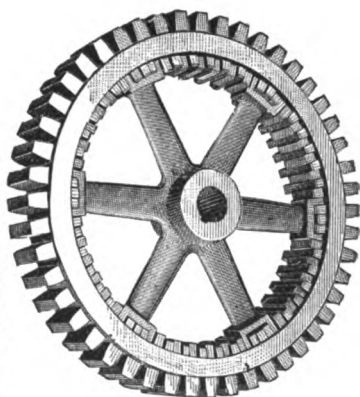


Fig. 904.

In ordering Bevel Gears to replace old or broken ones, give dimensions indicated by letters in cut; also number of teeth in each wheel.

BEVEL GEARS.

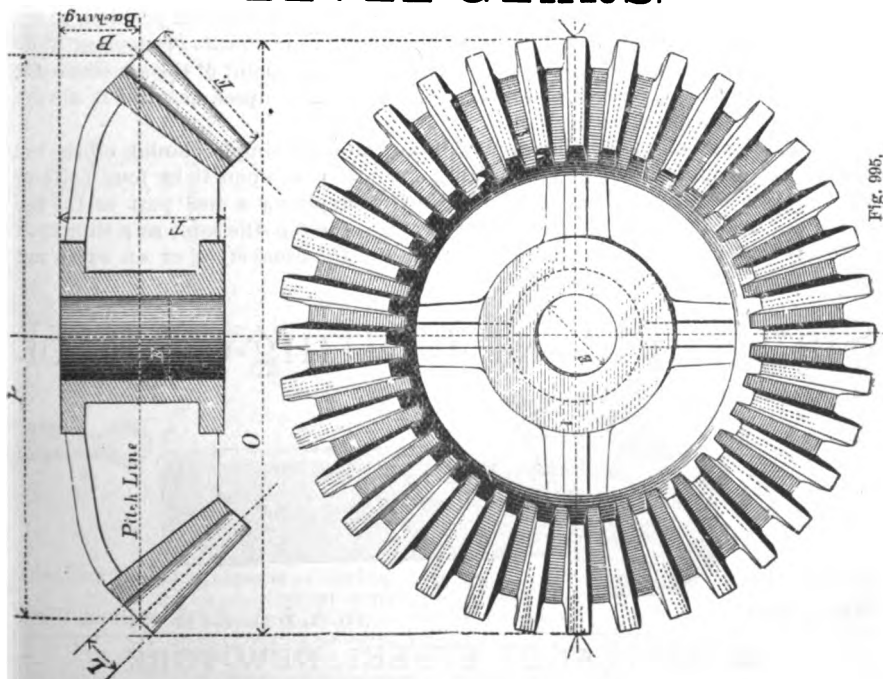


Fig. 905.

Lieb's Patent Elevating Tool Post.

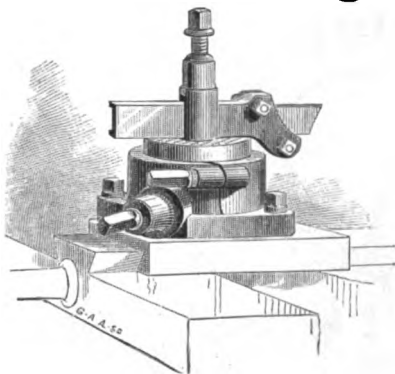


Fig. 996.

SIZES—12 in. for Lathes of 12 in. swing. 14 in. for Lathes of 14 in. swing.

This device consists of an outside or cast iron shell, having a hole carefully bored, to which a nut is carefully fitted. A steel screw has a square thread fitted to this nut, and is used for raising and lowering the steel tool post. This tool post is fitted to the nut by a conical-shaped bearing, which allows the tool post to be turned in all directions to suit the character of the work. A steel bevel gear is attached to the bottom of the screw, so that by applying a wrench to the square and turning it, motion is transmitted through the pinion to the gear, thereby raising or lowering the tool post as desired.

The tool always rests firmly upon the steel ring in a horizontal position, so the difficulties which ordinarily appear in tipping the tool, to elevate or depress it, do not appear in using this tool post. Furthermore, the point of the set screw for securing the tool is not readily broken nor flattened and upset, because it always has a square bearing upon the tool.

This tool post can be readily applied to any lathe by simply planing off the top of the slide upon the carriage and bolting the tool post upon it by four bolts, as will be understood from the cut. Instead of applying a tool post to the top of the nut, when desired the nut has a slot across the top, the same as a slide upon ordinary lathes, for the reception of a tool post of the usual style, or an extra nut can be supplied, made in this way.

Slate's Patent Cutting-off Tool.

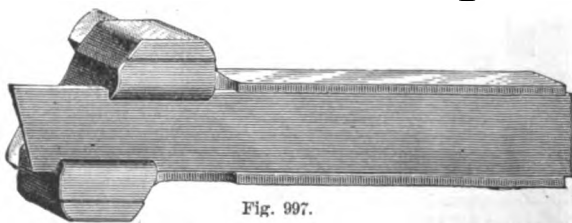


Fig. 997.

With blades..... $\frac{1}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$ or 1 inch thick.

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FOR PRICES SEE ACCOMPANYING LIST.

SPRING COTTERS AND KEYS.

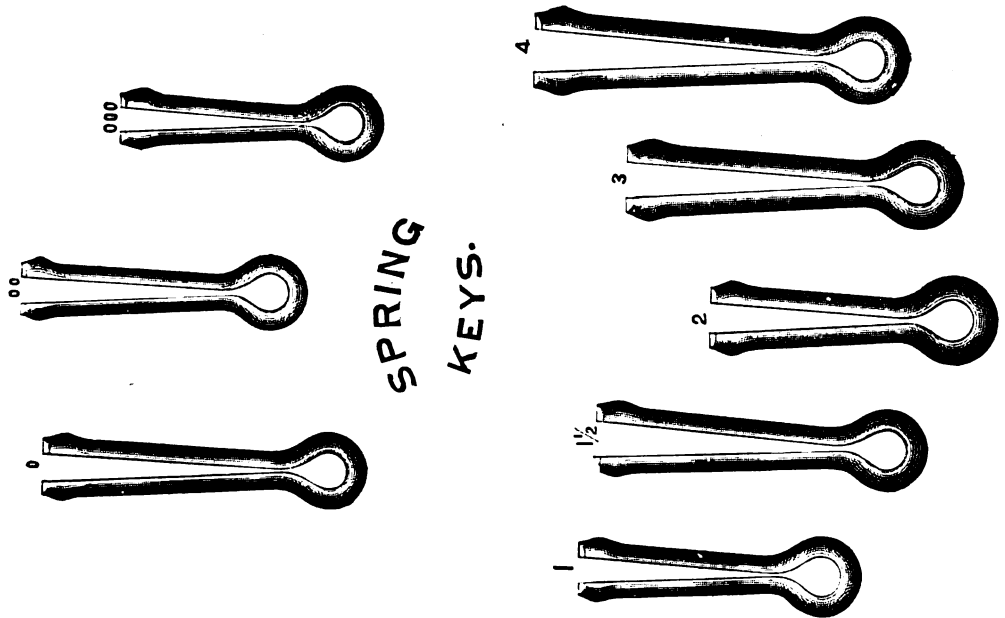


Fig. 999.

Of Flat Spring Keys we can make any size or thickness required, on short notice.

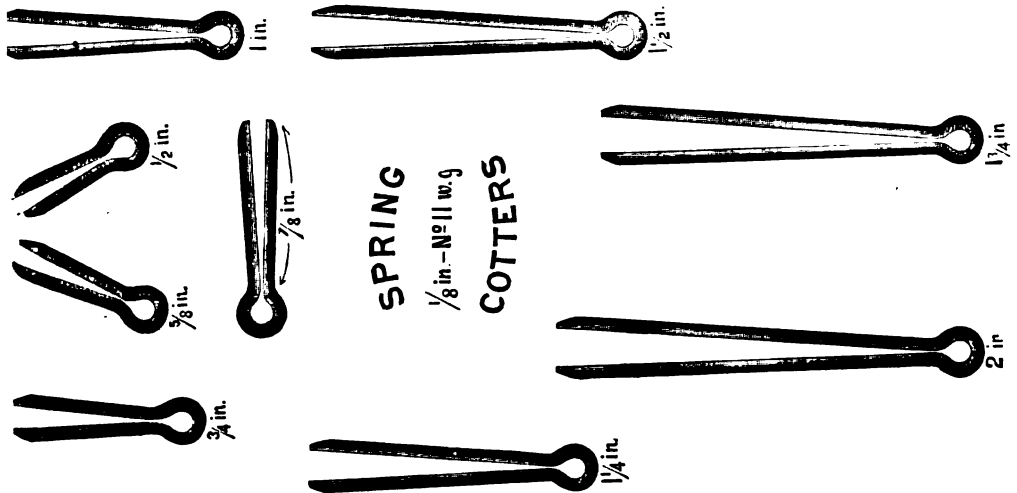


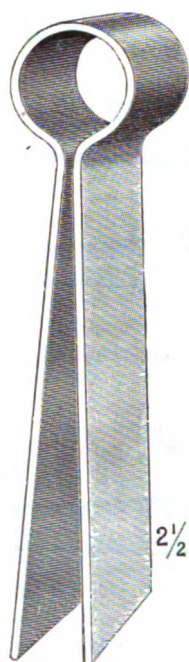
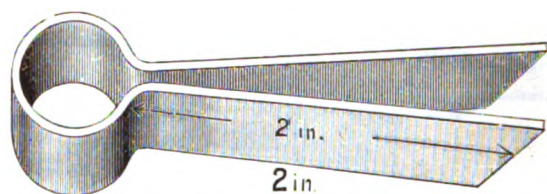
Fig. 1000.

The length measurements of Spring Keys and Spring Cotters given above are from point to neck or under the eye.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

FLAT SPRING KEYS.



FLAT SPRING
 $\frac{1}{2}$ inch wide
 16 and 17 wire gauge
KEYS



Fig. 1001.

CHAIN.



Fig. 1002.

For any size and for any service. Prices quoted on receipt of specification.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Malleable Iron Chain Links and Elevating and Conveying Machinery.

GRIP BELTING.

Single Strand Elevator.

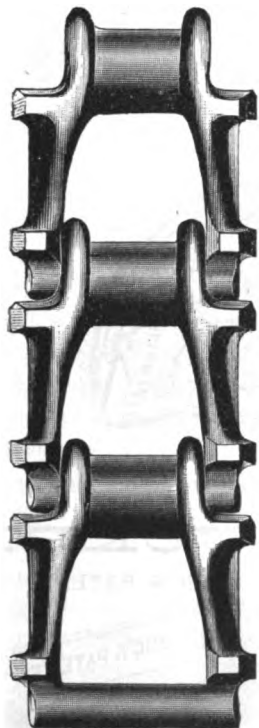


Fig. 1003.

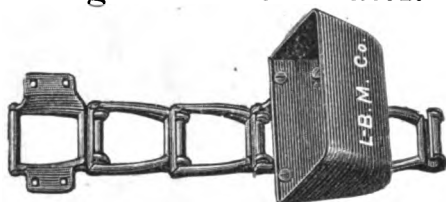


Fig. 1005.

Double Strand Elevator.



Fig. 1006.

Ordinary Link Belting.

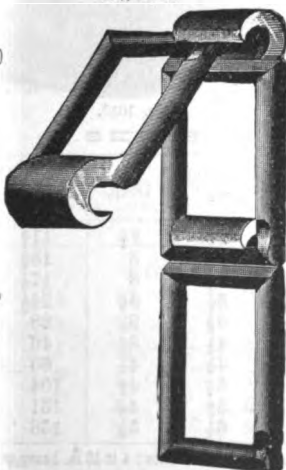


Fig. 1004.



Fig. 1007.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

SPROCKET WHEELS FOR LINK BELT ELEVATORS.

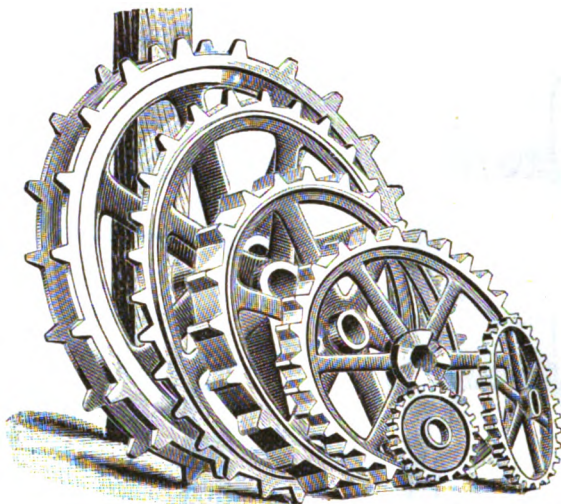


Fig. 1008.

PRICES ON RECEIPT OF SPECIFICATION.

ELEVATOR BUCKETS.

MALLEABLE IRON.



Fig. 1009.

SIZES.

Length in.	Width in.	Depth in.	Capacity qts.
4	3	2½	½
6	4	3½	1
7	4½	4	1½
8	5	4½	2
10	6	5	3½
12	7	6	6

"SALEM" BUCKETS,

STAMPED OUT OF SHEET IRON.

NO SEAMS, NO RIVETS.

Plain, Japanned or Galvanized.

SEE PRICE LIST.

DUC'S PATENT.

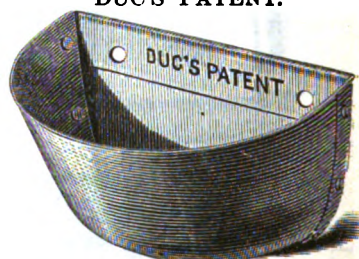


Fig. 1010.

SIZES.

On belt (width).	Projection (broad).	Deep.	Capacity in cubic inches.	Capacity in Dry Measure.
3½	2½	2½	11½	.....
4	2¾	3	13½	.....
4½	2¾	3	17½	.....
5	3½	3½	24½	.....
5½	3½	3½	28	.....
6	4½	3½	46	.....
7	4½	4½	65	1 qt.
8	5½	4½	104	1½ qt.
9	5½	4½	131	2 qt.
10	6½	5½	158	2½ qt.

2½ to 9 in. light or mill buckets; 4 to 10 in. heavy or ore buckets

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FOR PRICES SEE ACCOMPANYING LIST.

CALDWELL'S CONVEYOR.



Fig. 1011.

DESCRIPTION.

The shaft is wrought iron, lap-welded pipe, made especially for the purpose, round, smooth, strong, and in equal lengths, for all standard sizes. The shaft is very small, which brings the material to be moved so near the center that the leverage and friction on the shaft are greatly diminished. A very small diameter Conveyor is capable of doing a great amount of work, as the material is conveyed by the flight and not the shaft. The larger the shaft, the greater the amount of frictional surface, the more power it takes, and the less material it moves.

It is suitable for all classes of Mill Work. For bolting chests and purifiers it has no equal. The repairs alone saved by the use of this Conveyor will soon pay for it.

Figure 1012 shows end view of cast iron hanger in box, with sheet iron lining. This hanger is neatly made; the box in hanger is babbitted, and a piece of gas pipe for oil tube is cast in the hanger itself, so as to make smooth passage for oil, which is necessary in cold weather.

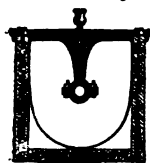


Fig. 1012.

Power can be transmitted through this Conveyor shaft at its further end. When this is done we make special arrangements for it, and should always be notified of the fact, so we can prepare the shaft properly.

SIZES.

No.	STANDARD LENGTHS.	INSIDE DIAMETER HOLLOW SHAFT.	DIAMETER OF CONVEYOR.	MAX. REV. PER MIN.	CAPACITY PER HOUR. BUSHELS.
1	8 feet	1 in.	4 in.	100	100
2	10 "	1½ "	6 "	120	300
3	10 "	1½ "	9 "	130	1,000
4	12 "	2 "	12 "	140	2,000
5	12 "	2 "	16 "	150	3,000
6	12 "	3 "	16 "	160	5,000
7	12 "	3 "	18 "	160	6,000

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FOR PRICES SEE ACCOMPANYING LIST.

CALDWELL'S PATENT ELEVATOR BOOT.

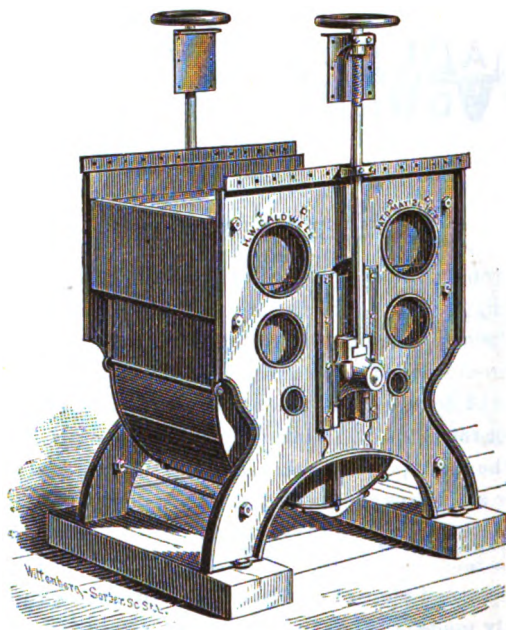


Fig. 1013.

There are two styles made. No. 1 we term low feed, and No. 2 high feed. No. 1, or low feed, is best adapted for large elevators, and where it becomes necessary to have the feed at a low point on the pulley. No. 2, or the high feed, is best when the height of feed makes no difference; and for cotton seed, wet material, oats or any soft matter, the material is taken up by the buckets as it falls from the spout, before it reaches the bottom of the Boot, thus preventing from packing or forming a body for the bucket to gouge into. In Boots where the pulley is 20 to 30 inches diameter use No. 1; 16 to 20 inches diameter, use No. 2. The rise and fall of the pulley is equal to half its diameter.

The diameter of the lower pulleys are correct for the width of belt they require. The belt should be one inch narrower than the pulley and the bucket one inch less width than the belt. The shaft in elevator heads should run 35 to 40 revolutions per minute. This Boot is not low priced but cheap at the price.

SIZE OF PULLEYS.

High Feed.....	16 in. diameter	x 9, 10, 12, 14, 16 in. face.
"	18 in. "	x 12, 14, 16, 18 in. "
Low Feed	20 in. "	x 14, 16, 18, 20 in. "
"	24 in. "	x 20, 22, 24, "

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FOR PRICES SEE ACCOMPANYING LIST.

MOULDER'S TOOLS.

HEART TROWEL.

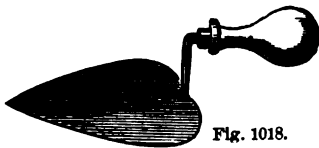


Fig. 1018.

SIZES.

Width.....2, 2½, 2¾, 3 inch.

SQUARE TROWEL.

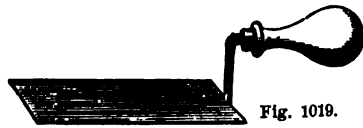


Fig. 1019.

SIZES.

Length..4, 4½, 5, 5½, 6 inch.
Width..1 to 2, 1 to 2, 1 to 2, 1 to 2, 1 to 2 "

LIFTER.

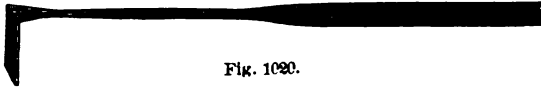


Fig. 1020.

SIZES.

Length..... 10 12 14 16 18 20 inch.
Width.....¼ to ½, ½ to 1, ½ to 1, ¾ to 1, 1 to 1 ½



Fig. 1021.

OVAL DOG TAIL.

TAPER ROUND POINT.



Fig. 1022.

Sizes.....1, 1½, 1¾ in.

BEAD SLICK.



Fig. 1023.

Sizes.....½, ¾, 1 in.

SPOON SLICK.



Fig. 1024.

Sizes.....1½ and 1¾ in.

FLANGE LIFTER.



Fig. 1025.

Sizes.....¾ x 16, 1 x 20 inch.

FLANGE AND BEAD.

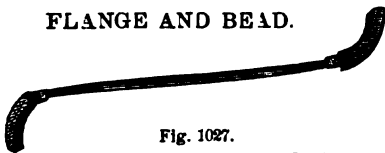


Fig. 1027.

Sizes.....¾ and 1 inch.

FLAT FLANGE.

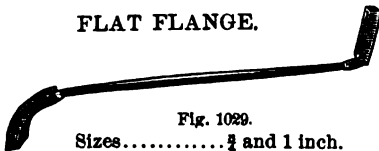


Fig. 1029.

Sizes.....¾ and 1 inch.

FLAT FLANGE.

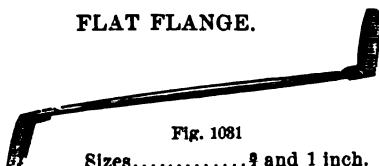


Fig. 1031

Sizes.....¾ and 1 inch.

SQUARE STREET.



Fig. 1028.

Sizes.....½, ¾, 1, 1½, 2 inch.

HEART AND SQUARE.

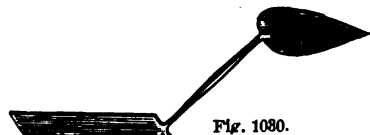


Fig. 1030.

Sizes.....1, 1½, 1¾, 2 inches.

HALF-ROUND CORNER SLICK.



Fig. 1032.

Sizes.....1, 1½, 1¾, 2 inch.

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FOR PRICES SEE ACCOMPANYING LIST.

MOULDER'S TOOLS.

CIRCULAR FLANGE.



Fig. 1033.

Sizes, $\frac{3}{4}$ and 1 inch.

DOUBLE SQUARE.



Fig. 1034.

Sizes, $\frac{1}{2}$ $\frac{3}{8}$ $\frac{3}{4}$ $\frac{7}{8}$ and 1 inch.

SQUARE CORNER.



Fig. 1035.

Sizes, 2 2 $\frac{1}{2}$ and 3 inch.

PIPE SLICK.



Fig. 1036.

FOUNDRY BELLOWS.

Pat'd Metallic Hinge.



Fig. 1037.

Sizes, 10 11 and 12 inch.

No. 4, STEEL WIRE BRUSHES.

For Cleaning Casting.

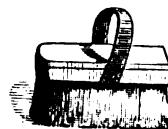


Fig. 1039.

Sizes, 2 $\frac{1}{2}$ in., 4 rows; 2 $\frac{1}{2}$ in., 5 rows;
and 3 in., 6 rows.

SWAB.



Fig. 1038.

Pure Flax.

SOFT BRISTLE BRUSH.



Fig. 1040.

HARD BRISTLE BRUSH.

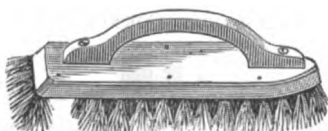


Fig. 1041.

No. 5, STEEL WIRE BRUSH.

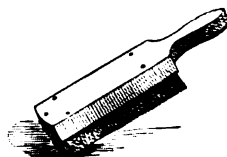


Fig. 1042.

Sizes, 2 $\frac{1}{2}$ in., 3, 4 and 5 rows.

No. 6, STEEL WIRE BRUSH.



Fig. 1043.

Sizes, 4 $\frac{1}{2}$ and 6 inches.

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FOR PRICES SEE ACCOMPANYING LIST.

FOUNDRY MATERIALS.

FOUNDRY FACINGS, DRY SAND, CHARCOAL, SEA COAL, Etc.

WIRE GOODS.

SAND SCREEN.

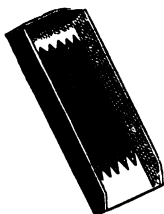


Fig. 1044.

Sizes.....24 and 26 inches.

FOUNDRY RIDDLE.

Brass, Steel, Iron or Galvanized.

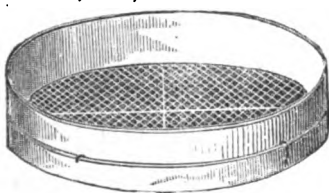


Fig. 1046.

Sizes.....16, 18 and 20 inches.

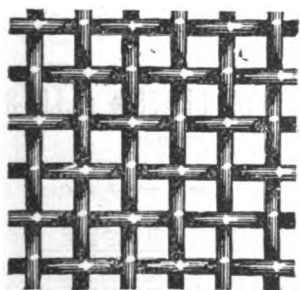
COAL SCREEN,

WITH STANDARD AND LEG IF DESIRED.



Fig. 1045.

SIZES.	WIDTH.	MESH.
No. 1.....	24 in.....	$\frac{1}{4}$ to $\frac{3}{4}$ in.
" 2.....	33 in.....	$\frac{1}{4}$ to $\frac{3}{4}$ in.
" 3.....	33 in.....	1 to 2 in.



No. 1047.

CRIMPED Locomotive Spark Wire Cloth,

OF STEEL OR IRON WIRE.

No. of Mesh.....	2	2½	3	3½	4	5x2	5	6	8	10	12
No. of Wire.....	9	10	11	12	13	14	14	15	16	18	20

STOUT RICE WIRE CLOTH.

No. of Mesh.....	8	10	12	14	16
No. of Wire.....	20	21	22	32	24

IRON, STEEL, BRASS AND COPPER WIRE

AT LOWEST MARKET PRICES.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PATTERN LETTERS, ETC.

ROMAN.

DORIC.

ROUND FACE
GOTHIC.SHARP FACE
GOTHIC.

Fig. 1048.



Fig. 1049.



Fig. 1050.



Fig. 1051.

FANCY.

GOTHIC BRAND LETTER.



Fig. 1052.

REGULAR SIZES.

Roman, $\frac{1}{2}$ to 4 inches.
 Doric, $\frac{1}{2}$ to 1 "
 R'd Face Gothic, $\frac{1}{2}$ to 1 $\frac{1}{2}$ "
 Sh'p " " $\frac{1}{2}$ to 1 $\frac{1}{2}$ "
 Fancy, $\frac{1}{2}$ to 1 "
 Brand, $\frac{3}{4}$ to 1 $\frac{3}{4}$ "



Fig. 1053.

STEEL LETTERS, FIGURES, STAMPS AND BRANDS.

PLUMBAGO OR GRAPHITE CRUCIBLES.



Fig. 1054.

All Sizes for MELTING GOLD, SILVER, COPPER, STEEL, BRASS & ALLOYS.

From a quarter pound capacity up to six hundred pounds.

Nos.	Height Outside. INCHES.	Diameter Top by Outside. INCHES.	Capacity of the Crucible by Weight of Water. LBS. OZ.	SIZES OF CRUCIBLES.													
				1	2	3	4	5	6	7	8	10	12	14	16	18	20
1	3 $\frac{1}{2}$	2 $\frac{1}{2}$	4 $\frac{1}{2}$														
2	3 $\frac{3}{4}$	2 $\frac{3}{4}$	6 $\frac{1}{2}$														
3	4 $\frac{1}{4}$	3 $\frac{1}{4}$	11														
4	5	4		1	1	1	1	2	2	3	3	4	4	4	4	4	8
5	5 $\frac{1}{2}$	4 $\frac{1}{2}$															
6	5 $\frac{3}{4}$	4 $\frac{3}{4}$															
7	6 $\frac{1}{4}$	5															
8	6 $\frac{3}{4}$	5 $\frac{1}{2}$															
10	7 $\frac{1}{2}$	6															
12	8 $\frac{1}{2}$	6 $\frac{3}{4}$															
14	9	7															
16	9 $\frac{1}{2}$	7 $\frac{1}{2}$															
18	9 $\frac{3}{4}$	7 $\frac{3}{4}$															
20	10	8															
25	10 $\frac{1}{2}$	8 $\frac{1}{2}$															
30	11	9 $\frac{1}{2}$															
35	11 $\frac{1}{2}$	9 $\frac{3}{4}$															
40	12 $\frac{1}{2}$	9 $\frac{1}{2}$															
45	13	9 $\frac{3}{4}$															
50	13 $\frac{1}{2}$	10															
60	14	10 $\frac{1}{2}$															
70	14 $\frac{1}{2}$	10 $\frac{3}{4}$															
80	15	11															
100	16	11 $\frac{1}{2}$															
125	18 $\frac{1}{2}$	12 $\frac{1}{2}$															
150	18	12 $\frac{3}{4}$															
200	19 $\frac{1}{2}$	14 $\frac{1}{2}$															
300	21	15 $\frac{1}{2}$															

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

SELLING AGENTS FOR
P. H. & F. M. ROOTS'
FORCE BLAST ROTARY BLOWERS,

**FOR FOUNDRIES, SMITH SHOPS, ROLLING MILLS, STEEL
 WORKS, SMELTING AND BLAST FURNACES, &c.**

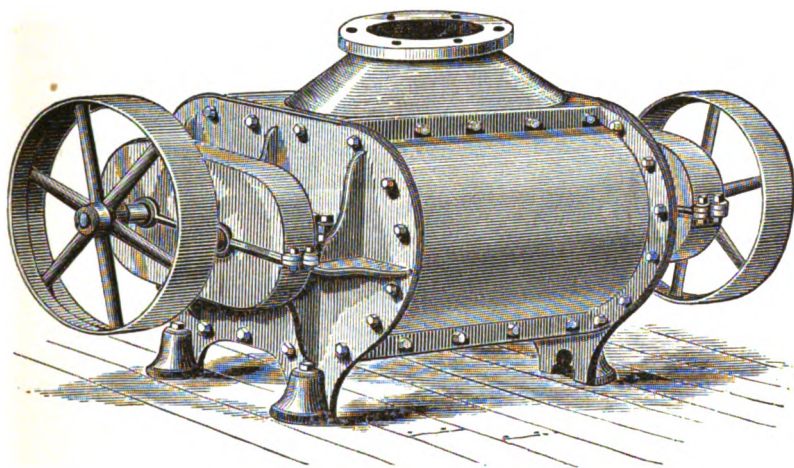


Fig. 1055.

Prizes awarded at Paris Exposition, 1867; American Institute Fairs, 1869, 1870, 1871 and 1873; and Silver Medal at Cincinnati Fairs, 1870, 1871, 1872 and 1873; Vienna Exposition, 1875; and Philadelphia Centennial Exposition, 1876;

AS

THE BEST MACHINE FOR PRODUCING BLAST.

The term *Blower* is used to designate a machine producing a blast having a positive force, and to distinguish it from a fan, which does not produce a force-blast. In this respect a blower is analagous to Cylinders used for producing blast. In either case the air forced must find an outlet or the machine must stop. But a fan can run with the outlet obstructed or entirely closed, without being in the least impeded.

The advantages of a force-blast are so great and apparent that it would seem not to require much argument on the subject; the saving of power, and other important advantages, will appear on examining testimonials at our office.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Roots' Force Blast Rotary Blower.

DESCRIPTION.

The external case of the Blower is made of cast iron. The cylindrical parts are bored out, true and accurate, on special tools. The head plates are faced off on boring mills especially arranged for the purpose. The gears are cut on the most scientific principles, and are noiseless in their operation.

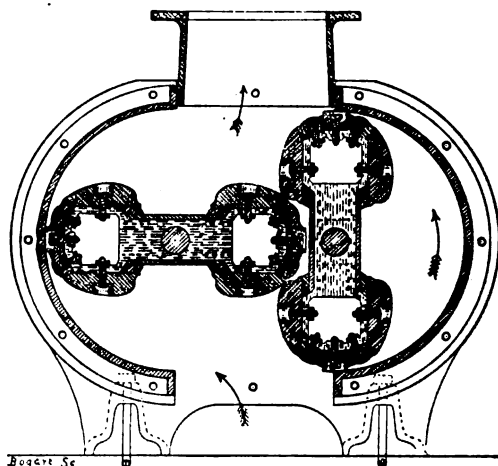


Fig. 1086.

VERTICAL SECTION THROUGH BLOWERS.

The above cut gives a sectional view through the revolvers, showing the wood covering securely bolted upon heavy iron cross-heads as a foundation. All the wood used in covering these revolvers is subjected to a process of our own, by which hard paraffine wax is forced through every pore of the wood at a high temperature, at the same time seasoning the wood and thoroughly saturating it with the wax, rendering it impervious to moisture. Wood prepared in this way neither shrinks nor swells, and thus entirely obviates serious difficulties with which we had to contend before discovering this process. There being no shrinkage in the wood the bolts do not get loose, and as moisture does not swell the wood covering, there is no liability of the revolvers rubbing or pounding each other from this cause, all difficulty from this source is entirely removed.

They are adapted to all purposes where either Blast or Exhaust is required, where the atmosphere is used under ordinary conditions as regards moisture or temperature, such as Foundries, Smith Shops, Rolling Mills, Steel Works, Brass Works, Copper Smiths, Blast Furnaces, Gas Exhausters, Heating Furnaces for Bolt Works and all kinds of Forging Works; Exhausting Dust from Grinding Rooms of Cutlery Works; Ventilation of Buildings, Mines, Tunnels; for Glass Works, Gunsmiths, Smut Mills; Smelting Works for Silver, Copper and Lead; supplying blast for Furnaces of all kinds, and all kinds of Drying Rooms, Jewelers, Dentists; Sand Blast Process for Engraving on Glass and Stone; Vinegar Manufactories; Butter Making; Sugar Refineries; Glue Works; Burning Liquid Fuel and Coal Dust; Grain Elevators, Conveyors and Dryers; Pitching Barrels for Breweries; Coolers for Distilleries, Breweries and Lager Beer Cellars; Blowing Organs; Feeding Printing Presses; conveying Telegrams and Packages in Pneumatic Tubes, and numerous other purposes.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

ROOTS' NEW IRON POSITIVE BLOWER.

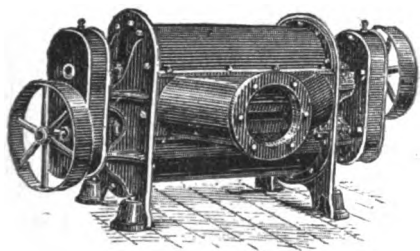


Fig. 107.

**BLOWERS TO DISCHARGE AT TOP, BOTTOM
OR SIDE AS ORDERED.**

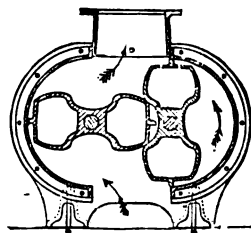


Fig. 108.

IRON REVOLVERS.

It is constructed entirely of metal, iron, steel and bronze, and does not shrink or swell, and will pass damp, hot or cold air, or dust, without injury.

The internal parts consist of two revolvers, each cast entire in one piece with no bolts, screws, nuts or washers, or other parts that can by any possibility get loose or cause trouble or injury.

All parts are finished to standard gauges, and are interchangeable. Its mechanical construction is of the highest order, with best workmanship and material throughout.

All the operating parts are accurately balanced, and it will bear easily double the speed of any other Positive Blower.

We recommend Blowers with iron revolvers for blowing or exhausting hot air or gases, hot steam, etc., in chemical works, sugar refineries, soda manufactories, fertilizing establishments, exhausting dust from cutlery works, emery wheels, grindstones and for smelting gold, silver, lead and copper ores, especially in very hot and dry climates.

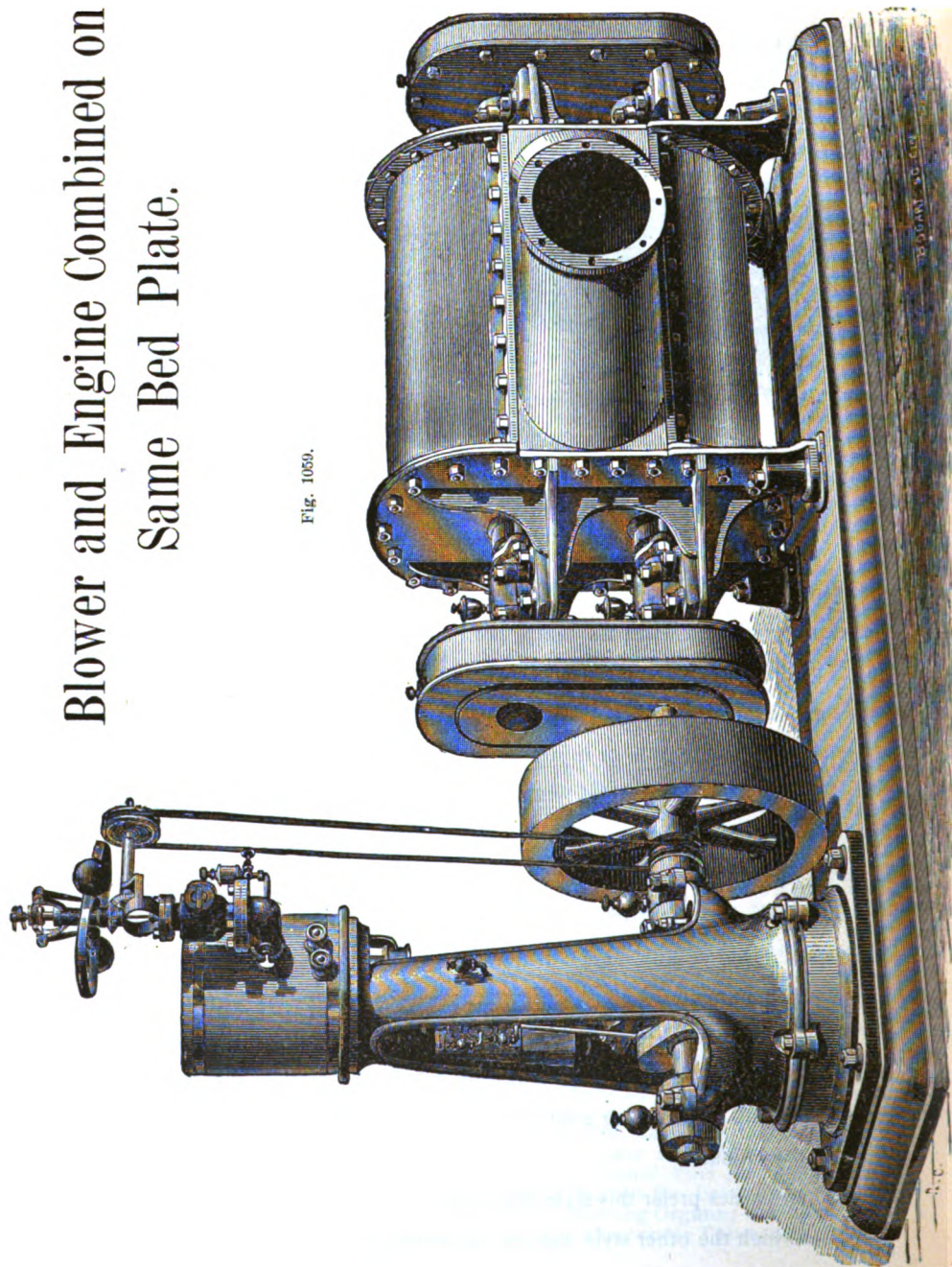
When parties prefer this style, they may be used for any, or all of the purposes for which the other style was recommended with equally good results.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Blower and Engine Combined on
Same Bed Plate.

Fig. 1059.



22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

ROOTS' ROTARY BLOWERS.

Sizes and Capacities for Smith Fires.

Size.	Cubic Feet of Air discharged each revolution.	Number of Fires suitable for, at various speeds, (revolutions per minute).							
		50	75	100	112	125	150	175	200
$\frac{1}{4}$	$\frac{1}{4}$	1		2			8		
$\frac{1}{2}$	$1\frac{1}{2}$		8		4		5		
1	8			5		6		8	10
2	5			8		10	12	15	
3	8			12		15		22	
4	13		16			28		40	
5	24	20		40		50			
6	42	85	52	70					
7	65	60	90	100					

Sizes and Capacities for Foundries.

Size.	Cubic Feet of Air discharged each revolution.	Adapted to Cupola inches inside the lining.	* TONS OF IRON MELTED AT VARIOUS SPEEDS.													
			Revolutions per minute.													
			112	125	130	140	150	160	175	180	200	210	220	230	250	300
1	3	18 to 24									$1\frac{1}{2}$				$1\frac{1}{2}$	
2	5	24 to 30								$1\frac{1}{2}$				$2\frac{1}{2}$		3
3	8	30 to 36								$2\frac{1}{2}$				$3\frac{1}{2}$		$4\frac{1}{2}$
4	13	36 to 42						$4\frac{1}{2}$				$5\frac{1}{2}$			$6\frac{1}{2}$	
5	24	42 to 50				$6\frac{1}{2}$				$8\frac{1}{2}$			$10\frac{1}{2}$			
6	42	50 to 60		$10\frac{1}{2}$			$12\frac{1}{2}$		$14\frac{1}{2}$							
7	65	72	$14\frac{1}{2}$		17		20									

* The amount of Iron melted, as given in the above tables, is based upon 30,000 cubic feet of air per ton of Iron melted, which is in accordance with the best authorities, and holds good in practice when all the conditions outside of the Blower are right.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

ROOTS' ROTARY BLOWERS.

Dimensions, Weights and Power Required for Horizontal Power Blowers.

DIMENSIONS—(IN INCHES).	Nos. of BLOWERS.								
	¼	½	1	2	3	4	5	6	7
Distance from center to center of Feet, lengthwise.....	22½	28½	33½	40½	44½	50	65½	71½	83½
Distance from center to center of Feet, crosswise.....	9½	11½	15½	14	18	19½	21½	31	36
Distance from bottom of Feet to top of Discharge Pipe.....	17½	21½	27½	31	30½	42½	48	60	70½
Diameter of Discharge Pipe at connection with Blast Pipe.....	5	6	8	10	12	14	16	20	24
Diameter of Discharge Pipe Flange, outside.....	8	9½	11½	13½	16	18	20½	25	29
Extreme width from out to out of Blower, crosswise.....	16½	20	27½	30½	36½	42½	49	60½	72
Extreme distance from out to out, lengthwise.....	41½	52½	62½	75½	81½	90½	114	127	145
Distance from center to center of Pulley Faces.....	39½	49½	58½	71½	76½	84½	106½	118½	134½
Diameter of Driving Pulleys.....	12	14	16	20	24	30	36	42	48
Width of Face of Pulleys.....	2½	2½	3½	4½	5½	6½	7½	8½	10½
POWER REQUIRED AND WEIGHTS OF BLOWERS.									
Average Horse-Power required under ordinary pressure.....	½	¾	2½	3½	5½	8½	15½	20½	26½
Weight of Blowers with <i>Wood-covered Pistons</i>	318	500	935	1400	1850	3000	4700	7000	10690
Weight of Blowers with <i>Iron Pistons</i>	459	650	1050	1610	2400	3518	5600	8770	13125

Dimensions, Weights and Power Required for Upright Power Blowers.

DIMENSIONS—(IN INCHES).	Nos. of BLOWERS.								
	¼	½	1	2	3	4	5	6	7
Distance from center to center of Feet, lengthwise.....	22½	28½	33½	40½	44½	50	65½	71½	85
Distance from center to center of Feet, crosswise.....	11½	13½	15½	17½	22½	25½	28½	35½	44
Vertical distance from bottom of Feet to center of Discharge Pipe.....	10½	13	16½	19	19½	25½	28½	34½	43
Diameter of Discharge Pipe at connection with Blast Pipe.....	5	6	8	10	12	14	16	20	24
Diameter of Discharge Pipe Flange.....	8	9½	11½	13½	16	18	20½	25	29
Extreme width of Blower from out to out, crosswise.....	18½	22½	29½	33	39	46½	52	64	76½
Extreme distance from out to out, lengthwise.....	41½	52½	62½	75½	81½	90½	114	127	145
Distance from center to center of Pulley Faces.....	39½	49½	58½	71½	76½	84½	106½	118½	134½
Diameter of Driving Pulleys.....	12	14	16	20	24	30	36	42	48
Width of Face of Driving Pulleys.....	2½	2½	3½	4½	5½	6½	7½	8½	10½
POWER REQUIRED AND WEIGHTS OF BLOWERS, ETC.									
Average Horse-Power required under ordinary pressure.....	½	¾	2½	3½	5½	8½	15½	20½	26½
Weight of Blowers with <i>Iron Revolvers</i>	485	768	1200	1660	2500	3700	6100	9240	13932
Weight of Blowers with <i>Wood-covered Revolvers</i>	346	628	1009	1400	2100	3100	5100	7475	11505
BLOWER AND ENGINE COMBINED.									
Weight of Blower with Engine and Bed Plate combined (Iron Revolvers).....	.....	.....	2400	3000	4700	6750	9920	14775	.....
Weight of Blower with Engine and Bed Plate combined (Wood covered Revolvers).....	.....	.....	2200	2740	4300	6150	8920	13000	.....
Extreme length of Bed Plate for Blower and Engine combined.....	.....	.....	82½	86½	107½	118	.....	.....	.....
Extreme width of Bed Plate for Blower and Engine combined.....	.....	.....	26	29½	35	36	.....	.....	.....
Height of Bed Plate.....	.....	.....	4½	4½	4½	6½	.....	.....	.....
Distance from center to center of Anchor Bolts, lengthwise of Bed Plate.....	.....	.....	59½	62½	79½	100	.....	.....	.....
Distance from center to center of Anchor Bolts, crosswise of Bed Plate.....	.....	.....	24	27½	32½	35½	.....	.....	.....
Height from bottom of Bed Plate to underside of Anchor Bolt Nut.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Size or Diameter of Anchor Bolt.....	2½	2½	3½	3½	3½	4½	4½	4½	.....
Extreme length of Bed Plate for Blower, without Engine.....	29½	35½	44	52½	56½	62	.....	.....	.....
Extreme width of Bed Plate for Blower, without Engine.....	18½	18½	26	29½	35	36	.....	.....	.....
Distance from center to center of Anchor Bolts, lengthwise.....	18	25	26	32	36½	44	.....	.....	.....

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

STEEL PRESSURE BLOWER.

LIST OF SIZES.

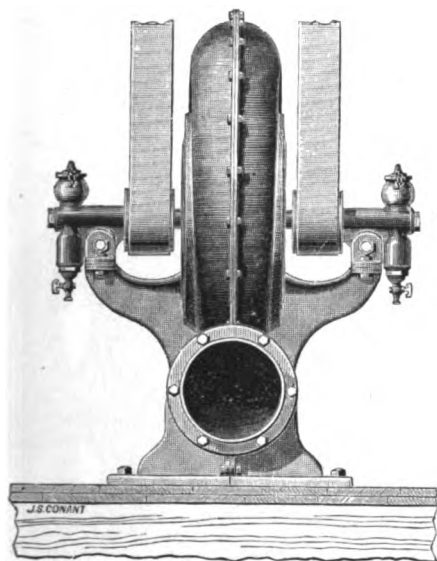


Fig. 1060.

Size of Blower in inches.	No. of Blower.	Diameter of Pulley in inches.	Face of Pulley in inches.	Diameter of Outlet.
	00	2½	1½	3½
	0	3	2½	4½
	1	3½	2½	4½
	2	3½	2½	5½
	3	4½	3½	6½
	4	4½	3½	7½
40	5	5½	3½	8½
45	6	6½	4½	10½
53	7	7½	5½	11½
64	8	9	6½	13½
75	9	10	7½	16
81	10	12	9½	18½

“Monogram” Blower and Exhauster.

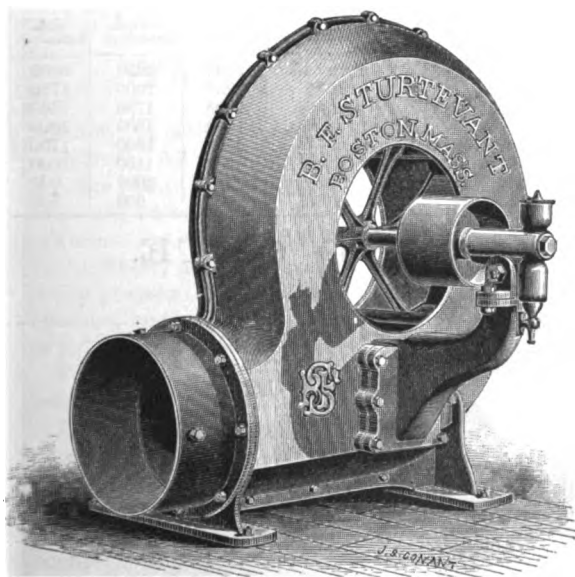


Fig. 1061.

THE FOLLOWING LIST OF DIMENSIONS APPLIES TO BOTH.

No. of Blower.	Square Feet Grate Surf.	Diam. Inlet	Diam. Outlet	Diam. of Pulley.	Face of Pulley.	Cubic ft. of air per min.	H. Power
00	5	5	4	2½	1½	500	....
0	6	5½	4½	3	2½	640	....
1	8	6½	5½	3½	3	800	....
2	10	7½	6½	4	3½	1019	1.79
3	14	9	7½	4½	4	1288	1.11
4	20	10½	9	5	5	1688	1.51
5	27	12	10½	6	6	1994	2.10
6	36	14	12	7	7	2701	2.86
7	48	16	14	8	8	3689	3.77
8	62	18	16	9	9	4847	4.76
9	80	21	18	10	10	6115	6.35
10	100	24	21	12	12	8771	8.34
				14	14	10702	

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

EXHAUSTING FANS FOR PLANING MILLS, &c.

WITH BOILER PLATE RIM AND REVERSIBLE MOUTH PIECE

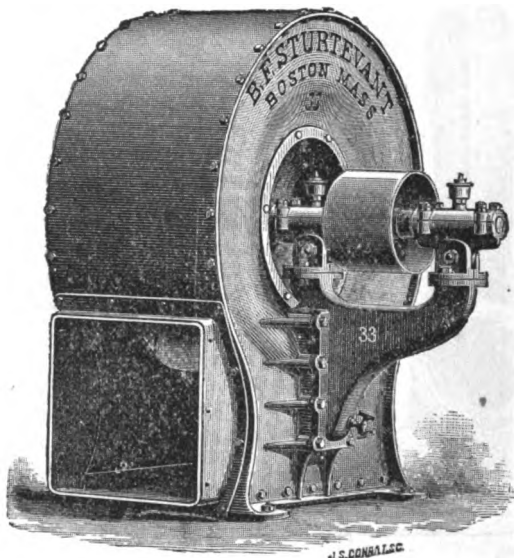


Fig. 1062.

PRINCIPAL DIMENSIONS IN INCHES.

Size No. of Exhauster.	Height and Diam. of all three widths	Diam Inlet of all three widths.	Size Outlet narrow Exhauster.	Size Outlet medium Exhauster.	Size Outlet wide Exhauster.	Diameter and Face Fulleys all three widths Exhausters.	Ord'y Speed narrow Exhauster.	Ord'y Speed medium Exhauster.	Ord'y Speed wide Exhauster.
28	30 in.	12½ in.	9½ x 7	9½ x 9½	9½ x 11	5 x 4½	2600	2250	2000
29	33 "	14 "	11 x 9	11 x 11	11 x 13	6 x 5	2250	2000	1750
30	38 "	16 "	12½ x 10	12½ x 12½	12½ x 15	7 x 6½	2000	1750	1500
31	43 "	18 "	14 x 11½	14 x 14	14 x 17½	8 x 6½	1750	1500	1300
32	49 "	21 "	16½ x 13½	16½ x 16½	16½ x 20	9½ x 7½	1500	1300	1150
33	55 "	24 "	18½ x 15	18½ x 18½	18½ x 23	11 x 8½	1300	1150	1000
34	65 "	27½ "	21½ x 17	21½ x 21½	21½ x 27	13 x 10½	1150	1000	900
35	74 "	31 "	24 x 18½	24 x 24	24 x 30	14 x 12½	1000	900	800

BLAST OR WIND GATE.

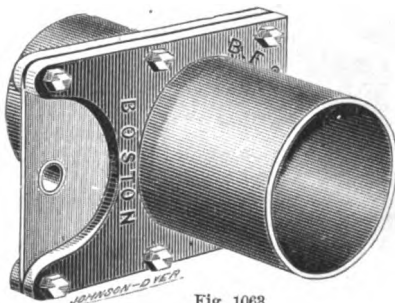


Fig. 1063.

SIZES.

Composition...1½ to 4 in.

Iron.....5 to 24 "

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

Roots' Patent Improved Gas Exhauster.

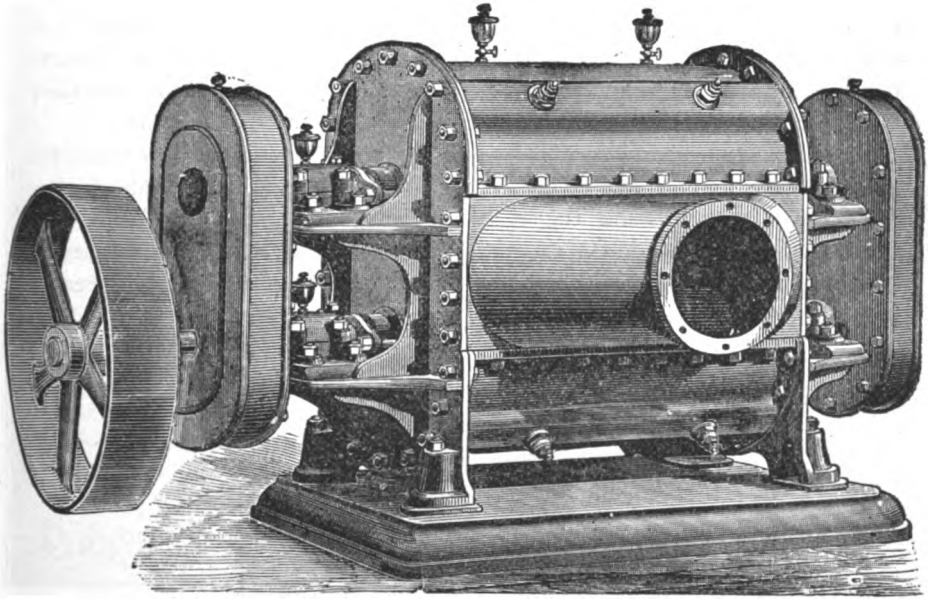


Fig. 1064.

What is Claimed for this Exhauster.

FIRST. It is the simplest in its mechanical construction of any Exhauster in use.

SECOND. All parts of the Machine requiring attention, as the Journals and Gearing, are external, and can easily be observed and attended to, the internal parts requiring no care.

THIRD. As the internal operating parts do not move in actual contact, but yet so closely as to be practically Gas tight, and as there are no valves sliding under pressure, the friction and wear are thus all confined to the Journals and Gearing, and are greatly lessened, and the power required to operate the Machine is reduced to the minimum, and the durability is correspondingly increased.

FOURTH. All parts of the Exhauster, internal as well as external, are easily accessible.

FIFTH. The construction of the Machine is such that if, from gross neglect or accident, repairs are needed, they can readily and expeditiously be made. By a peculiar arrangement of the Journal Boxes, the wear of the Journals is provided for, and can be easily remedied, or new lining inserted, and the arrangement is such that in either case all the parts will be brought absolutely into their proper positions without any adjustment whatever.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

ROOTS' PATENT IMPROVED GAS EXHAUSTER.

SIXTH. The operation of the Exhauster is not injuriously affected by the deposition of the tar and pitch on the internal operating parts of the Machine as is the case with others. The arrangement for disposing of the excess of tar is complete. They are built in the most complete and substantial manner, with steel shafts, etc. We build Exhausters of any required capacity, large or small.

These Exhausters have been used for several years by the Manhattan Gas Company of New York City, and by the Hudson Gas Company, N. Y., and also by the Gas Companies of Pittsburg, Cincinnati, St. Louis, San Francisco and Louisville; Hartford, Conn.; Newark, O.; City of Mexico; Nashville, Tenn.; Penitentiary at Columbus, O.; Toronto, Ont.; Derby Gas Light Co.; Birmingham, Conn.; Brantford, Ont.; Soldiers' Home, Dayton, O.; Sioux City, Iowa; Hamilton, O.

SECTIONAL VIEW OF GAS EXHAUSTER.

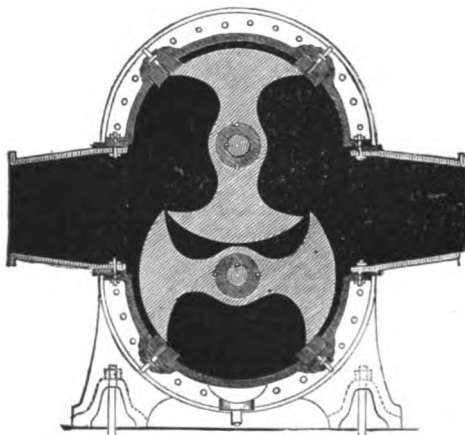


Fig. 1065.

LIST OF SPEEDS AND CAPACITIES OF EXHAUSTERS.

No. $\frac{1}{2}$ will exhaust $\frac{1}{2}$ cubic feet per revolution.				Speed per minute, 120 revolutions.			
" 1	"	$\frac{1}{2}$	"	"	"	110	"
" 2	"	$1\frac{1}{2}$	"	"	"	100	"
" 3	"	$5\frac{1}{2}$	"	"	"	90	"
" 4	"	11	"	"	"	80	"
" 5	"	17	"	"	"	70	"
" 6	"	25	"	"	"	60	"

FULL PARTICULARS UPON APPLICATION.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Roots' Rotary Hydraulic Engine.

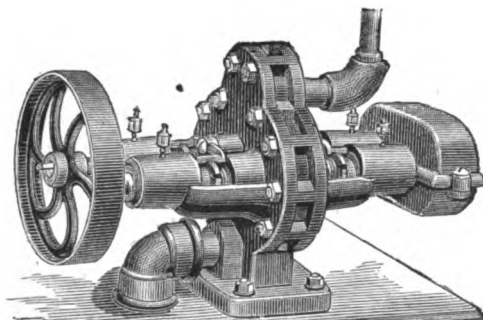


Fig. 1066.

The advantages of this Engine consist principally in the economical use of water; in obtaining a rotary motion direct; in the ease in which it can be controlled; in many cases acting automatically, needing no supervision; also, in the extreme simplicity of its construction, its durability, neatness, and compactness, and the slight care required for its management.

Dimensions of Roots' Rotary Hydraulic Engine.

Number of Engine.	Diameter of Gears.	Face of Piston.	Diameter of Supply Pipe.	Diameter of Discharge Pipe.	Length of Engine.	Width of Engine.	Height of Engine.	Cubic inches of Water per Revolution.	Number of Revolutions per Minute.	Power at 60 lbs. per Square Inch.
No.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inches.		
1	2½	1½	1	1¼	12	8	8	12.7	250	0.25
2	2½	2	1	1¼	12½	8	8	16.9	225	0.35
3	2½	2½	1¼	1½	13	8	8	21.2	200	0.45
4	3½	1½	1¼	1½	22¼	11	13	34.6	180	0.5
5	3½	2	1½	2	23¼	11	13	46.0	170	0.7
6	3½	2½	1½	2	24¼	11	13	57.7	160	0.9
7	5	1½	2	2½	26½	15½	16½	69.6	150	1.1
8	5	2	2	2½	27	15½	16½	94.2	140	1.5
9	5	2½	2½	3	27½	15½	16½	117.8	130	1.8
10	6½	2	2½	3	38½	20	22¼	159.2	120	2.5
11	6½	4	3	3½	40½	20	22½	318.5	100	3.5
12	6½	6	3½	4	42½	20	22½	477.8	85	4.5

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE BACKUS WATER MOTOR.

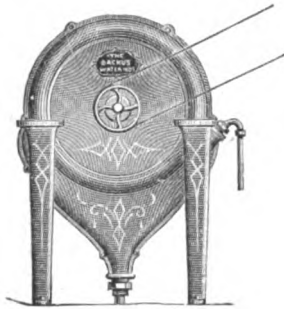


Fig. 1067.

This cut shows the 17-inch Motor. These are used for Parlor Organs, Polishing Jewelry, running Wax-thread Machines for Harness, and other heavy work; also supplying air for Portable Gas Machines, Ventilation in Stores and Offices, Turning Lathes, Jig or Scroll Saws. Under a pressure of 60 pounds or upwards, Printing Presses, Coffee Mills, Refrigerators, small Sausage Cutters for Hotels and Butchers; also for Revolving Hair Brushes, taking the place of the hand or foot power for all kinds of light and fatiguing work. Supply pipe 1 to 1½ inches.

Table of Horse Power.

The 7 and 11-inch Motors are adapted to Sewing Machines and all light work, such as Scroll Saws, small Lathes, where the pressure is from 15 pounds up.

7-inch Motor will run any Family Sewing Machine at 30 pounds pressure, 11-inch at 15 to 25 pounds.

Full instructions sent for setting each sized Motor.

PRESSURE FROM 20 TO 40 POUNDS.

SUPPLY PIPE.	WASTE PIPE.	HORSE POWER.	SIZE JET.
7-in. Motor.	¾-in. to 1-in.		⅜ to ⅝ in.
11 " "	¾ " 1 "		Jets used from ⅝ in. up.
17 " "	1½ " 3 "	½ to 1½	" " "
22 " "	1½ " 4 "	½ " 2	" " "
30 "agl. "	2 " 5 "	1 " 3	" " "
30 "dbl. "	3 " 6 "	2 " 4	" " "
45 "dbl. "	3 " 6 "	3 " 5	" " "

PRESSURE FROM 40 TO 80 POUNDS.

SUPPLY PIPE.	WASTE PIPE.	HORSE POWER.	SIZE JET.
17-in. Motor.	1½-in. to 3-in.	1 to 1½	Jets used from ⅝ in. up.
22 " "	1½ " 4 "	2 " 2½	" " "
30 "agl. "	2 " 5 "	3 " 4	" " "
30 "dbl. "	3 " 6 "	4 " 6	" " "
45 "dbl. "	3 " 8 "	6 " 8	" " "

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

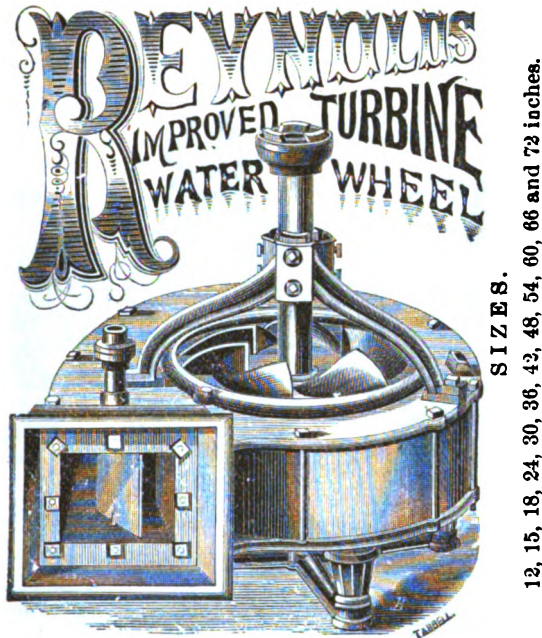


Fig. 1068.

The wheel, without case, consists of a short cylinder supporting a hub for the shaft; blades nearly radial and plane, projecting from the circumference of the cylinder, form the surface upon which the water impinges; a circular disk attached to each end of the cylinder and edges of the blades, plane except the swell for the issues, confines the water, and with the cylinder and blades form the body of the wheel which is cast whole. The swell for the openings to discharge the water commences in the disk, on that side of the blade against which the water is directed, near the cylinder, and enlarges both in the axial and radial directions to a point near the plane of the next blade, where it forms a curved opening, large towards the cylinder and small towards the circumference of the wheel, and which discharges the water in a direction opposite to that in which it approaches the wheel. To conform strictly to theory, neither disk nor issues should present a plane surface, but convenience, economy and strength warrant the form above described, as it gives a near approximation to the maximum effect of one made in a more perfect form, while the wheel may be cast whole and can be made of great strength without the aid of bolts or bench work.

In order to apply the water this wheel is placed in a circumferential scroll case which lays on the water tangentially and concentrically. This circumfluent application of the water allows large openings to be used, and favors a low velocity of the issuing water, as the centrifugal force holds the water to its work and retards the discharge.

Those making inquiries or ordering wheels should state particularly the head and fall, the quantity of water they have at low water and the effective power they desire, or the kind and quantity of machinery they expect to propel and the direction the wheel is to run.

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FOR PRICES SEE ACCOMPANYING LIST.

ROOTS' IMPROVED ROTARY PUMP.

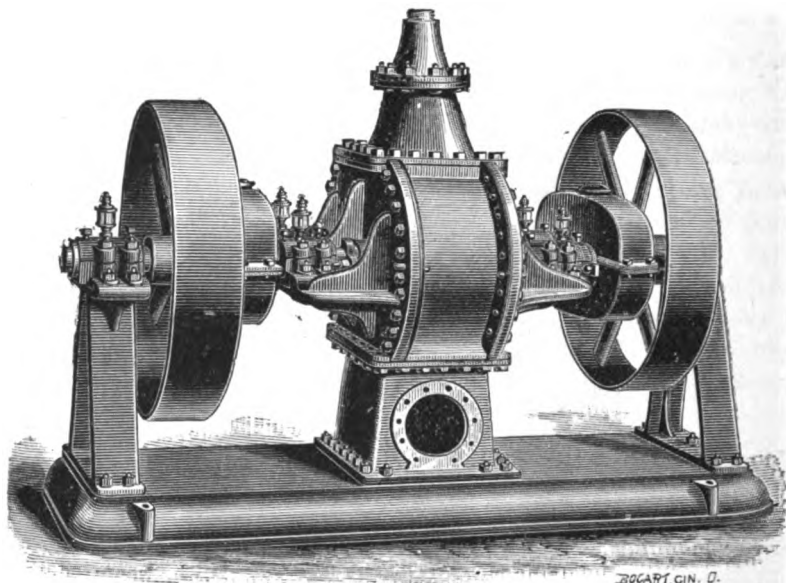


Fig. 1069.

They are positive in their action, operating by a regular displacement of their entire contents each revolution, whether they run fast or slow, under high or low pressure. They will thus force water to any required height or distance, and give any required pressure. The height, distance, and pressure, being simply a question of power, which is in the exact ratio to the work to be done.

These Pumps are adapted to all purposes for which either Rotary or Reciprocating Pumps are used—such as pumping water oil, syrups, or other liquids, hot or cold, in paper mills, sugar and oil refineries, and water works of all kinds.

On account of their compactness, and the small space occupied, and the large volume discharged, as compared with the reciprocating Pumps, they are peculiarly adapted for Pumps on ships and steamers. They can be constructed of sufficient size to empty the largest ocean steamer in a few minutes.

Size and Capacity of Roots' Rotary Force Pump.

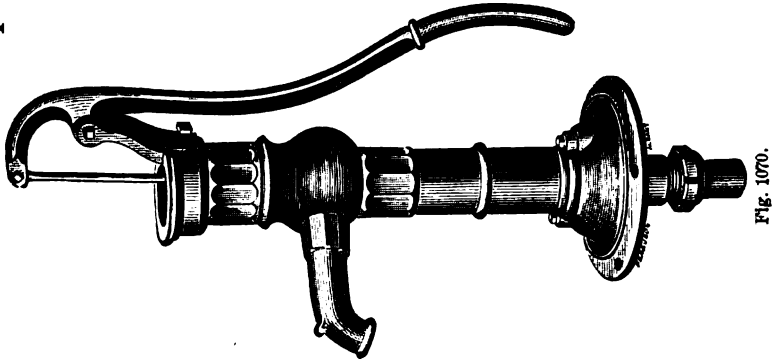
No.	Size of Gears.	Largest Size of Openings.	Capacity per rev. Galls.	Capacity per min. Galls.	Capacity per hr. in Galls.	Capacity per rev. in cubic ft.	Speed per min. of Pump.
1	8 $\frac{1}{2}$ Inches.	8 Inches.	7	1,050	63,000	1	150 rev.
2	10 "	9 "	10	1,250	75,000	1 $\frac{1}{2}$	125 "
3	12 "	11 "	16	1,600	96,000	2 $\frac{1}{2}$	100 "
4	14 "	13 "	28	2,300	138,000	4	85 "
5	16 "	15 "	42	3,000	180,000	6	72 "
6	20 "	18 "	87	5,200	312,000	12 $\frac{1}{2}$	60 "
7	24 "	22 "	140	7,000	420,000	20	50 "

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FOR PRICES SEE ACCOMPANYING LIST.

PUMPS.

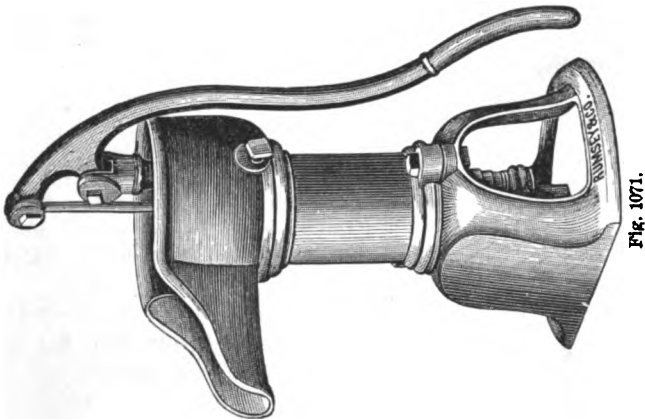
Iron Cistern Pump.



SIZES.

Number.....	0	1	2	3	4	5	6	7
Diameter of Cylinder, inches..	2	2½	2¾	3	3½	3¾	4	4½
Gallons per stroke.....	½	¾	1	1½	2	2½	3	3½
Suction Pipe, inches.....	1	1 or 1½	1½	1½ or 2	2	2½ or 3	3	3½ or 4

Pitcher Spout Cistern Pump.



SIZES.

Number.....	1	2	3	4	5
Diameter of Cylinder, inches..	2½	3	3½	4	4½
Gallons per stroke.....	½	¾	1	1½	2
Suction Pipe, inches.....	1 or 1½	1½ or 2	2 or 2½	2½ or 3	3 or 3½

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FOR PRICES SEE ACCOMPANYING LIST.

ANTI-FREEZING
CISTERN AND WELL
PUMP.
CLOSE OR OPEN TOP.

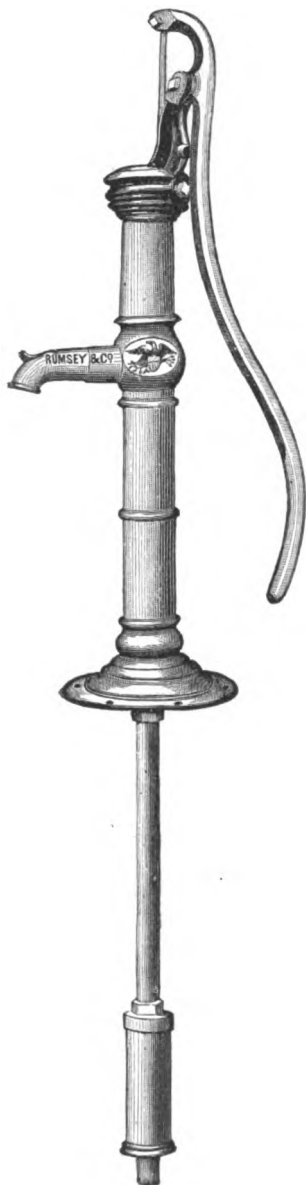


Fig. 1072.

PUMPS.
Force Pump on Base,

WITH TOP AND SIDE OUTLET.

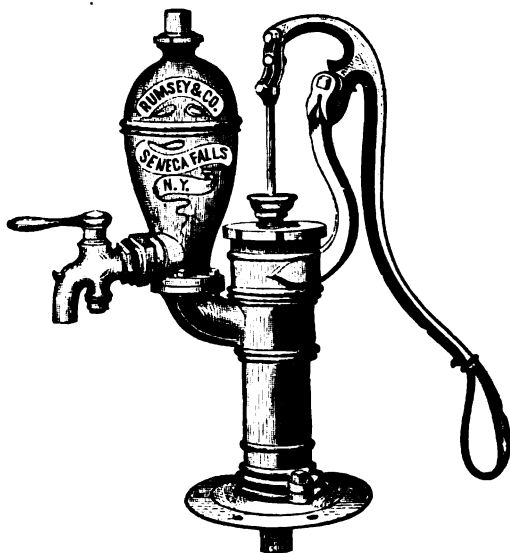


Fig. 1073.

SIZES.—Fig. 1073.—BRASS OR IRON.

Number.....	1	2	3
Diameter of Cylinder, in....	2½	3	4
Gallons per stroke.....	½	½	¾
Size of Suction Pipe, in.....	1½	1½ or 1¾	1½ or 2

This style can be furnished without the side cock, or with top outlet only, or without air chamber.

SIZES.—Fig. 1072.

Number.....	2	3	4	4½
Diameter of Cylinder, in....	2½	2¾	3	3½
Gallons per stroke....	½	½	½	¾
Size of Suction Pipe, in.....	1	1½	1½	1½ or 1¾

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FOR PRICES SEE ACCOMPANYING LIST.

PUMPS.

FORCE PUMP, ON PLANK—IRON OR BRASS.

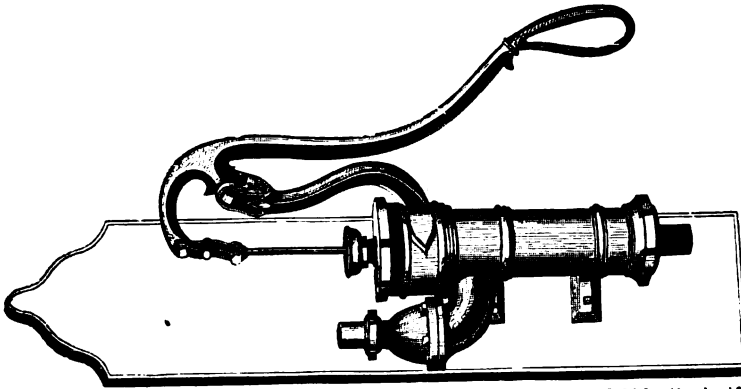


Fig. 1074. This Pump furnished with Air Chamber and Side Cock, if desired.
WIND MILL TANK FORCE PUMP.

No.	Bore.	Capacity.	Size Pipe.
1	2½ in.	½ gall.	1½ in.
2	3 " "	¾ " "	1½ or 1¾ " "
3	4 " "	1 " "	1½ or 2 " "

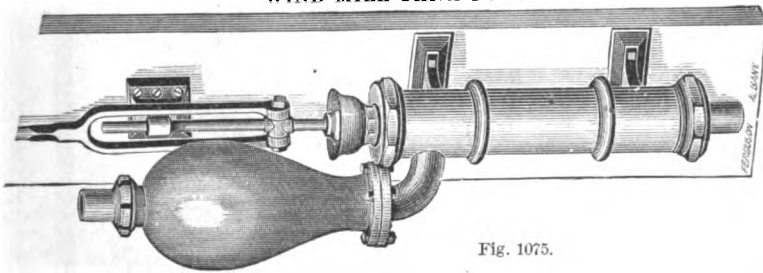


Fig. 1075.

No.	Bore.	Capacity.	Size Pipe.
1	2½ in.	½ gall.	1½ in.
2	3 " "	¾ " "	1½ or 1¾ in.

This Pump is made in iron or brass, and with base and hand attachment, if desired.
COLUMN BOILER FEED PUMP—FOR HAND AND POWER.

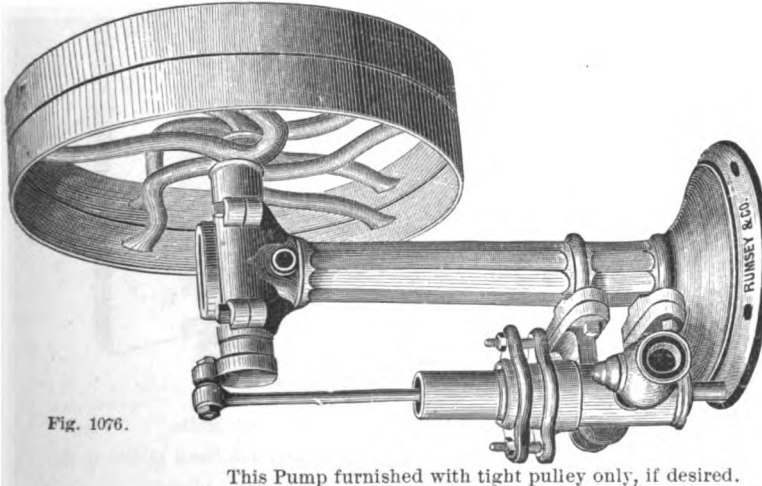


Fig. 1076.

No.	Bore.	Stroke.	Capacity.	Speed.	Size Pipe.
1	2 in.	3 in.	1½ gall.	50	1 inch.
2	2½ " "	3 " "	1½ " "	50	1½ " "
3	3 " "	3 " "	1½ " "	45	1½ " "
4	2 " "	6 " "	1½ " "	40	1 " "
5	2½ " "	6 " "	1½ " "	40	1½ " "
6	3 " "	6 " "	1½ " "	40	1½ " "

This Pump furnished with tight pulley only, if desired.

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FOR PRICES SEE ACCOMPANYING LIST.

PUMPS.

DOUBLE ACTING Force Pump. Railroad Force Pump.

IRON OR BRASS.

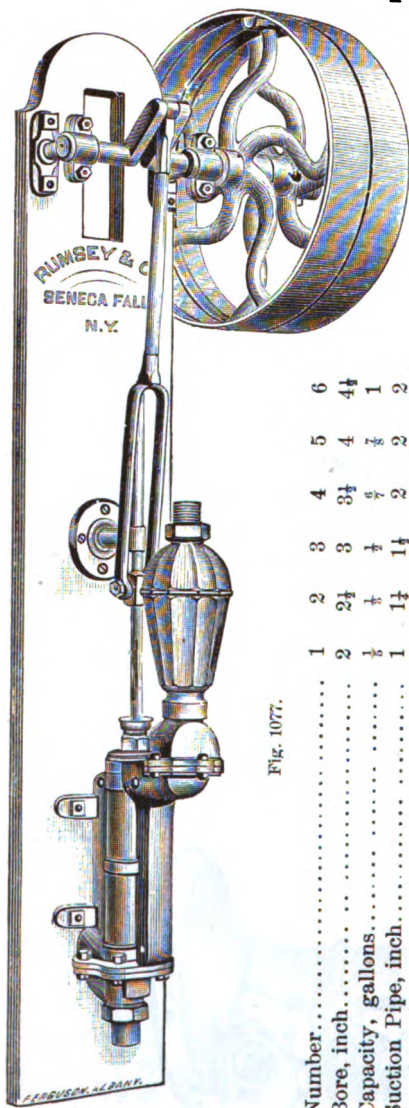


Fig. 1077.

Number.....	1	2	3	4	5	6
Bore, inch.....	2	2½	3	3½	4	4½
Capacity, gallons.....	½	¾	1	1½	2	2½
Suction Pipe, inch.....	1	1½	1½	2	2	2

Nos. 1, 2 and 3 with Hand Crank instead of Pulleys if desired. Nos. 4, 5 and 6 made with Gun Metal Valves if desired.

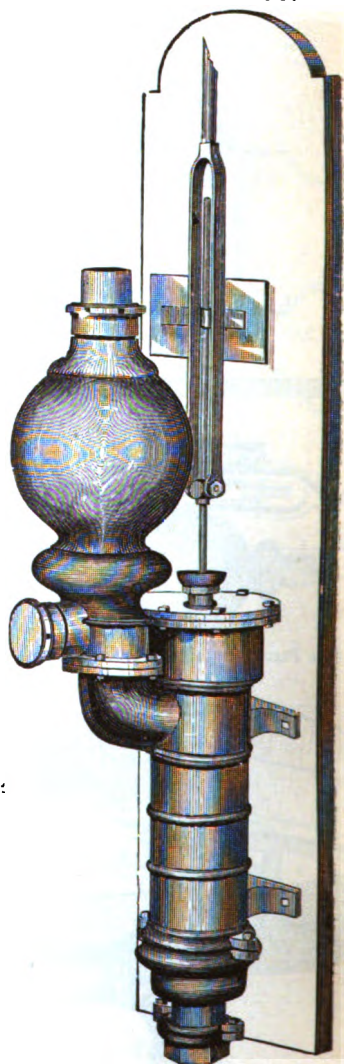


Fig. 1078.

BORE.	STROKE.	CAPACITY.	SECTION PIPE.
4 in.	10 in.	100 galls.	2 in.

This Pump rigged for hand power if desired.

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FOR PRICES SEE ACCOMPANYING LIST.

PUMPS.

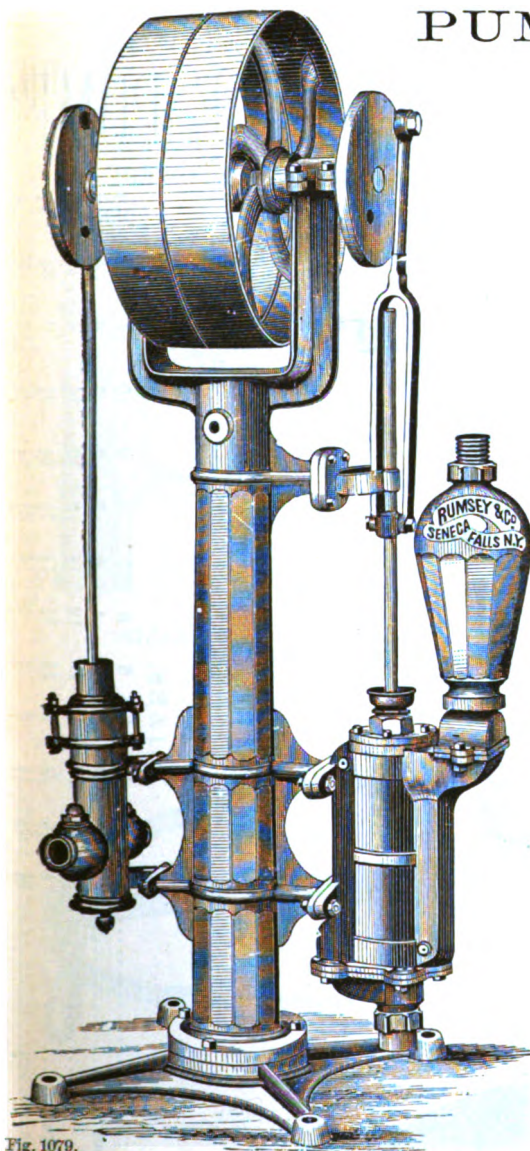


Fig. 1079.

STEAM BOILER AND TANK
FORCE PUMP.

MOUNTED ON COLUMN WITH
PULLEYS, FOR POWER.

Fig. 1079 represents a Single-Acting Force Pump for feeding Steam Boilers, under pressure, and a Double-Acting Force Pump for supplying Tanks, mounted on an Iron Column, with connecting-rods and pulleys for power. Both Pumps can be operated at the same time, or either disconnected at will. These Pumps are intended for use in Steam Saw Mills, Factories, &c. Repeated tests have proven them to be a serviceable and very convenient article. We make five sizes.

Parties can have the sizes of these Pumps reversed at the same price: that is, use small Force Pump and large Boiler Pump, or large Force Pump and small Boiler Pump.

Still further, parties can have any size of Force Pump and Boiler Pump; and the Price will be made by addressing us.

SIZES.

No.	FORCE PUMP.		BOILER FEED PUMP.	
	Bore, 2 $\frac{1}{2}$ inches.	Capacity, $\frac{1}{2}$ gall.	Bore, 2 inches.	Capacity, 20 horse boiler.
1.	3	"	2 $\frac{1}{2}$	34
2.	3 $\frac{1}{2}$	"	2 $\frac{1}{2}$	34
3.	4	"	3	52
4.	4 $\frac{1}{2}$	"	4	80

We can also furnish above with two force and two feed cylinders.

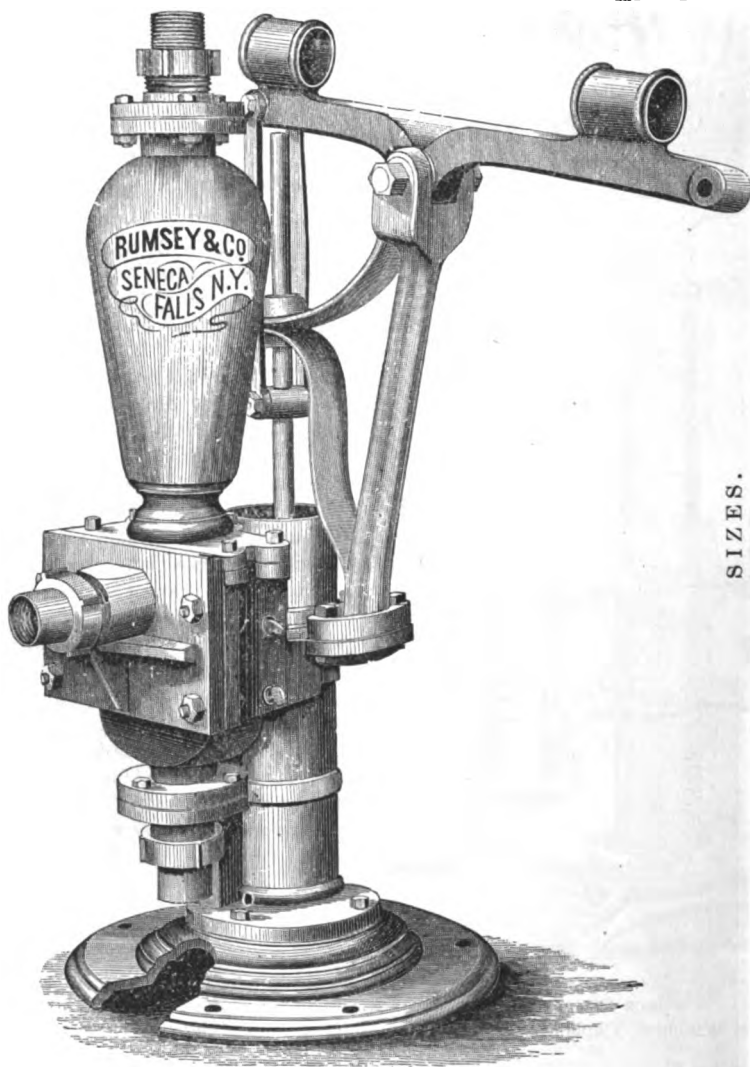
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FOR PRICES SEE ACCOMPANYING LIST.

PUMPS.

PACIFIC RAILROAD FORCE PUMP,

DOUBLE ACTING—ON RASE—FOR HAND AND POWER.



SIZES.

Number.....	1	2	3	4	5	6	7	8	9	10	11	12	13
Bore, inches.....	3	3	4	4	4	4	4	5	5	5	6	6	8
Stroke, ".....	8	10	12	8	10	12	14	8	12	14	8	12	10
Capacity, Gallons.....	1	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2	2	2	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2	3 $\frac{1}{2}$	4 $\frac{1}{2}$
Size of Pipe, inches.....	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2	2	2	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3	3	4

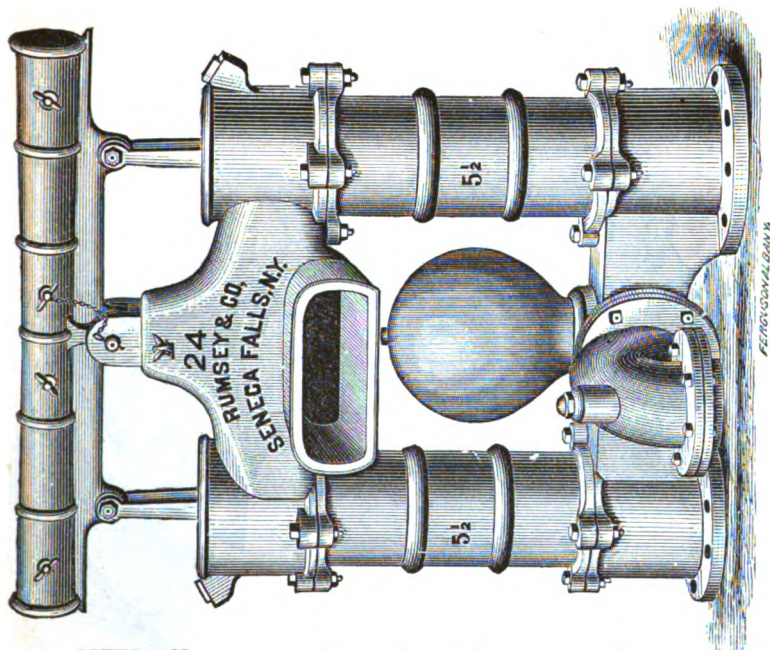
Fig. 1080.

ALL IRON OR BRASS-LINED CYLINDERS.

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FOR PRICES SEE ACCOMPANYING LIST.

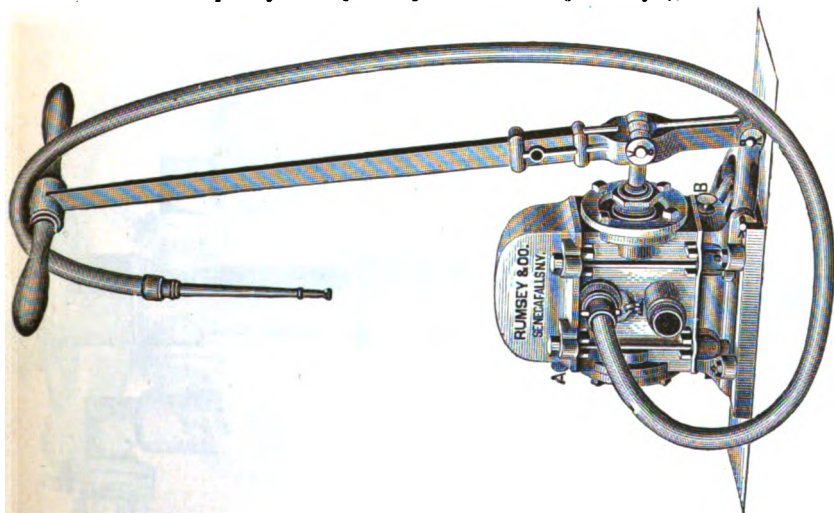
SHIP'S MAIN OR BILGE PUMP—WITH WOOD LEVERS.



All Iron or Copper-lined Cylinders.
Fig. 1081.

SIZES.—Nos.	1	2	3	4	5	
Bore,	5	5 1/4	6	7	8	inches.
Stroke,	8	8	8	8	8	"
Capacity,	1 1/4	1 1/2	2	2 1/4	3 1/4	gallons.

DOUBLE-ACTING FORCE PUMP.



IRON OR BRASS.
Fig. 1082.

SIZES.—Nos.	1	2	3	4	
Bore,	3	4	5	6	inches.
Capacity,	1 1/4	1 1/2	2	2 1/4	gallons.
Size of Pipe,	1 1/2	1 1/2	2	2 1/2	inches.

Nos. 3 and 4 are also made with double lever.

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FOR PRICES SEE ACCOMPANYING LIST.

PUMPS.

HORIZONTAL DOUBLE-ACTING SUCTION AND FORCE PUMP.
With Crank, Shaft and Pulleys for Power.—IRON OR BRASS.

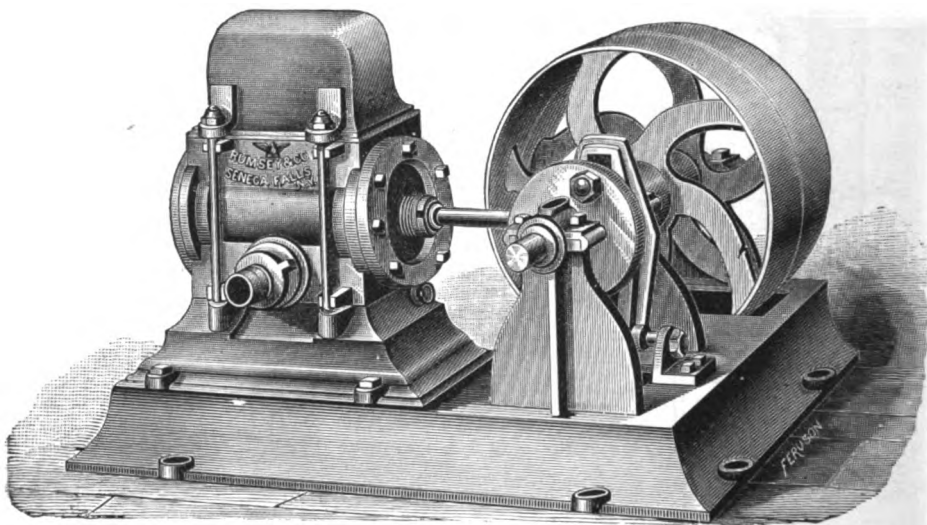


Fig. 1083.

SIZES.—Nos.	1	2	3	4
Bore,	3	4	5	6 inches.
Capacity,	$\frac{1}{10}$	$\frac{1}{2}$	$\frac{1}{2}$	$1\frac{1}{2}$ gallons.
Size of Pipe,	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$ inches.

STEAM BOILER FORCE PUMP—FOR POWER.

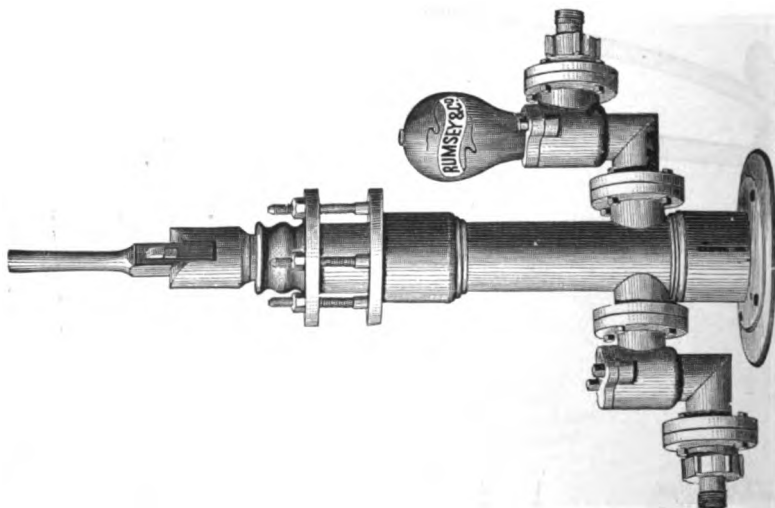


Fig. 1084.

SIZES.—Nos.	1	2	3	4
Bore,	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 inches.
Stroke,	12	12	12	12 "

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PUMPS. **STEAM BOILER FEED PUMP.**

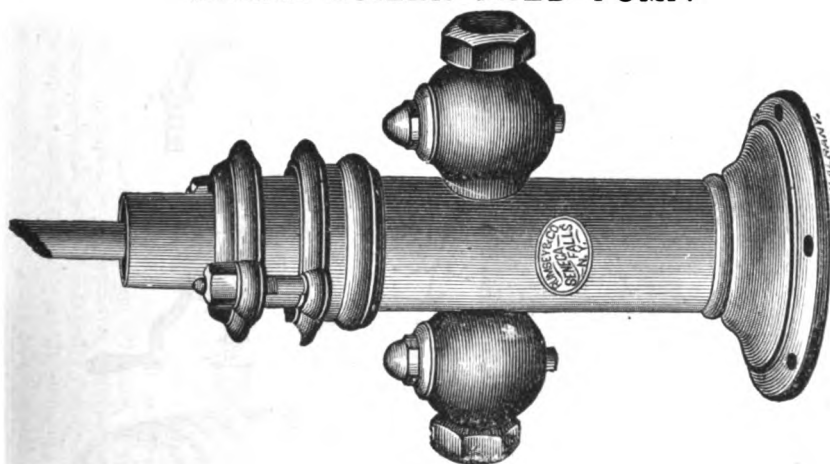


Fig. 1085.

SIZES.

No.....	1	2	3	4	5	6	7
Bore, inches.....	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	4	5
Stroke ".....	6	6	6	6	6	10	10
Speed (strokes).....	50	50	45	40	40	40	40
Size of Pipe, inches.....	$\frac{3}{4}$	1	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$
Capacity, galls.....	$\frac{1}{32}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{9}{86}$	$\frac{1}{2}$	$\frac{1}{2}$

HAND ROTARY PUMPS.

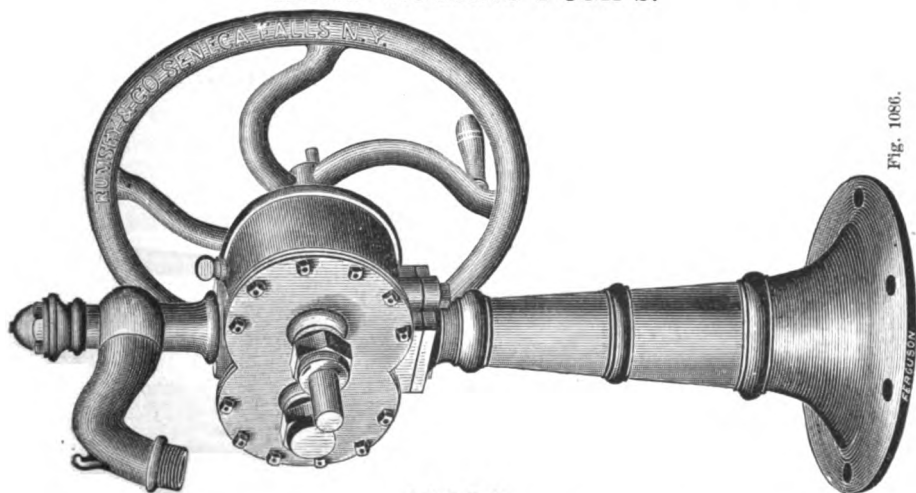


Fig. 1086.

SIZES.

No.....	1	2	3	4	5
Capacity, galls.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Size of Pipe, inches.....	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2
Size of Hose, inches.....	1	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2

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P U M P S.

HAND ROTARY PUMP, WITH IMPROVED BARREL ATTACHMENT.

IRON OR BRONZE.

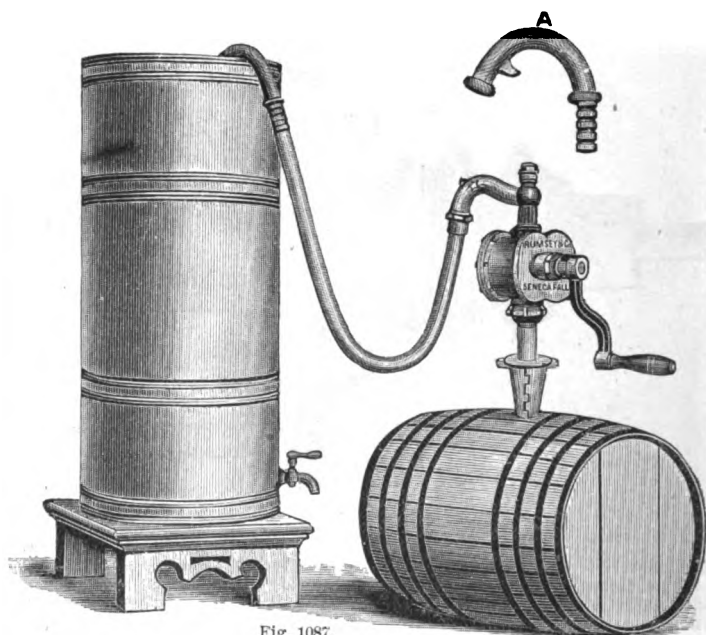


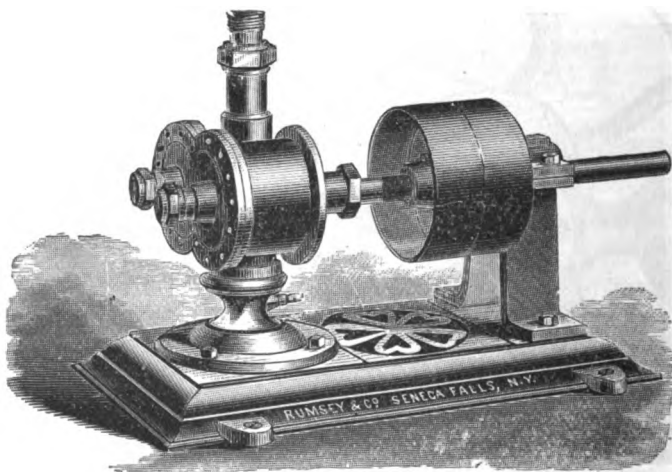
Fig. 1087.

No. 1.....	1 inch Suction and Discharge for $\frac{3}{4}$ inch Hose, 10 galls. per min.
" 2.....	1 " " " " 1 inch " 13 " "

POWER ROTARY FORCE PUMP.

IRON OR BRONZE.

WITH TIGHT AND LOOSE PULLEYS.



SIZES.	Size of Pipe.	
	Capacity.	1 $\frac{1}{4}$ inches.
No. 1.	$\frac{1}{4}$ gallon.	1 $\frac{1}{2}$ "
No. 2.	" "	2 "
No. 4.	" "	" "

Fig. 1088.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

ROTARY POWER FIRE PUMP.

WITH AIR CHAMBER AND SAFETY VALVE.

The annexed cut correctly represents one of our Rotary Fire Force Pumps, having air chamber and safety valve, and so arranged that one, two or three lines of hose can be attached for fire protection of mills, factories, warehouses, etc. They are perfect in operation and results. We furnish all necessary apparatus to conduct

water from these Pumps to any required distance or height, with openings at different points for attaching hose. Hydrants, play-pipes, hose and couplings always kept in stock and supplied at lowest market rates.

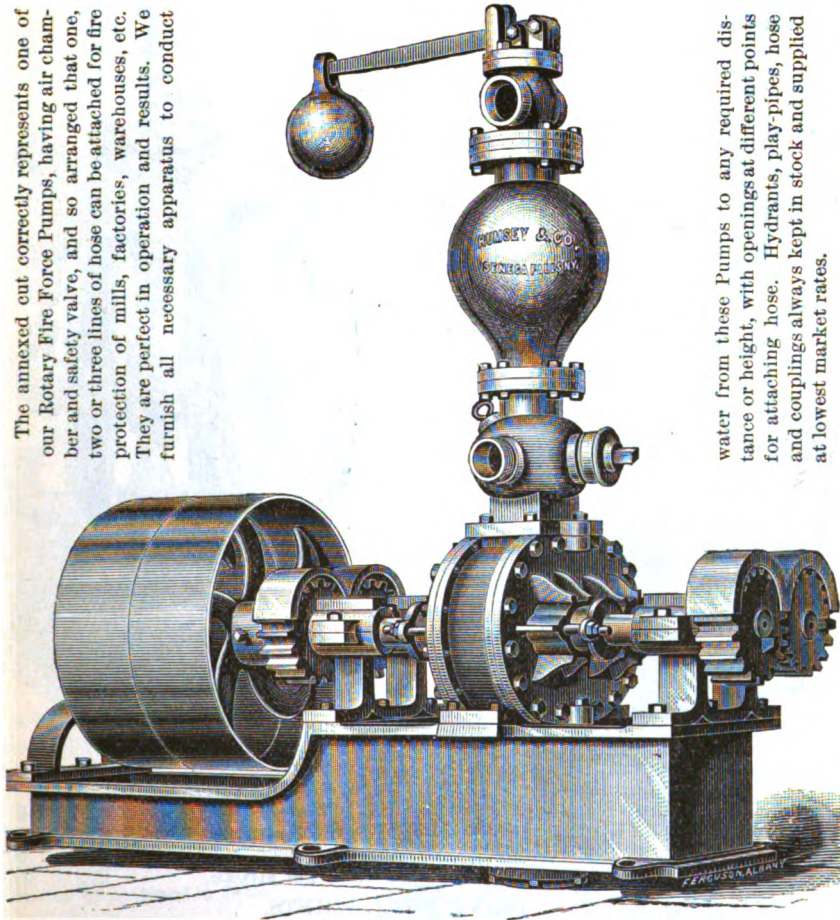


Fig. 1089.

Although pulleys are shown in cut, we advise the use of gearing where practicable, as more reliable than belts in case of fire. Furnished, if desired, without Air Chamber or Safety Valve.

Prices include Safety Valve and Outside Shaft.

SIZES.

	Size of Pulleys.	Capacity per Revolution.	Proper speed per minute.	Size Suc. Pipe.	Size Dis. Hose.	No. of Streams.
No. 1,	14x4½	1-3 gal.	350 rev.	2 in.	1½ in.	1
No. 2,	16x5½	6-7 "	325 "	2½ "	1½ or 2 "	1
No. 3,	18x6½	1 1-4 "	300 "	3 "	2 "	2
No. 4,	20x8½	1 3-4 "	280 "	4 "	2 or 2½ "	2
No. 5,	Geared.	2 1-16 "	200 "	5 "	2½ "	3

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PUMPS.

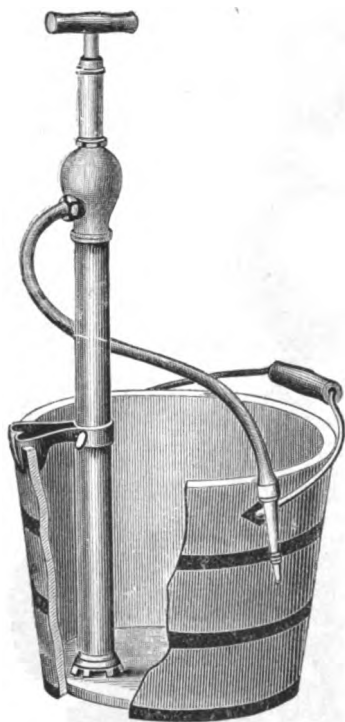
FIRE EXTINGUISHER
WITH PAIL.

Fig. 1090.

- No. 1. { Medium Size.
20 in. barrel.
No. 2. { Large Size.
24 in. barrel.

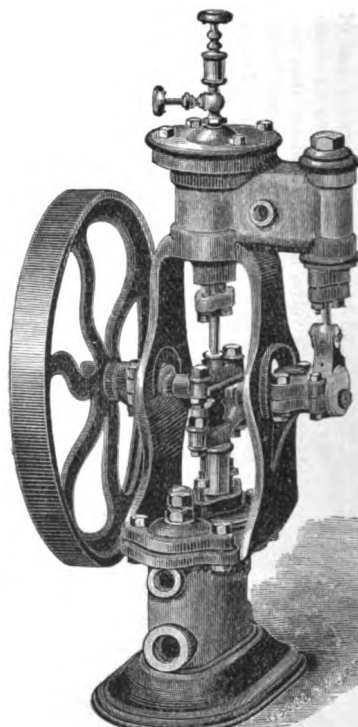
BUCKET PLUNGER
STEAM PUMP.

Fig. 1091.

SIZES.		A	B
Diam. Steam Cylinder		3 in.	4 in.
" Water "		1½ "	2½ "
Length of stroke,		2 "	2½ "
Revolutions,		100	90
Gallons per stroke,		2½	5½

DRIVE WELL POINTS.



Fig. 1092.



Fig. 1093.

		SIZES.							
Number,		1	2	3	4	5	6	7	8
Diam. of Pipe,		1½	1½	1½	1½	1½	1½	2	2 inches.
Length of Pipe,		24	30	36	42	50	56	56	48
No. of holes,		80	100	120	100	120	100	250	300
					140	160	120	140	350
								350	400

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PUMPS.

PLUMBERS' HYDRAULIC PRESSURE PUMP.

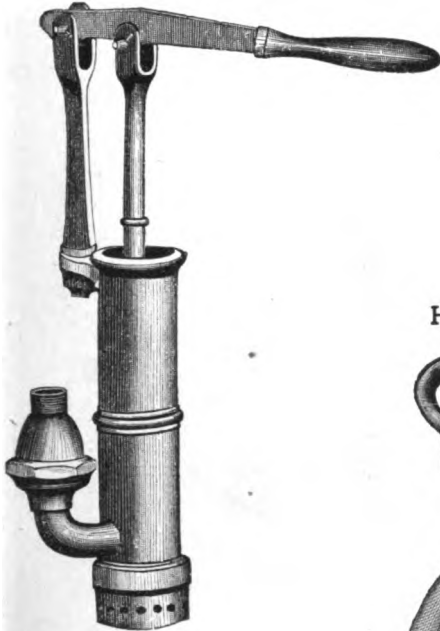


Fig. 1094.

SIZES.—FIG. 1094.

Bore.....2 inches.

Capacity..... $1\frac{1}{4}$ gallons.

HAND AIR PUMPS.

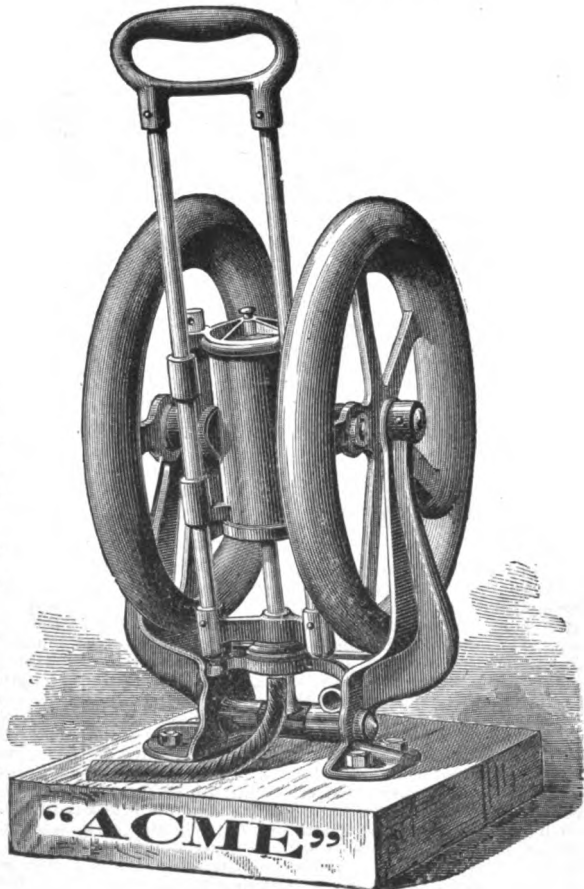


Fig. 1095.

Figure 1095 represents the "Acme" Pump. Height, 24 in. Base, 13x9 in.; Fly Wheels 12 in. Bore, 2 in.; Stroke, 4 in.; Weight 34 lbs.

With this Pump a pressure of 30 lbs. can be obtained in little more than a minute.

We also make the "Pearl." Wheels, $10\frac{1}{2}$ in.; Bore, $1\frac{5}{8}$ in.; Stroke, 3 in.; Height, $17\frac{1}{2}$ in.; Weight, 18 lbs.

The "Peerless." Wheels, 15 in. Cylinder, $2\frac{3}{4}$ in. bore x 6 in. stroke; Height, 26 in.; Weight, 60 lbs.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

IMPROVED HYDRAULIC RAMS.

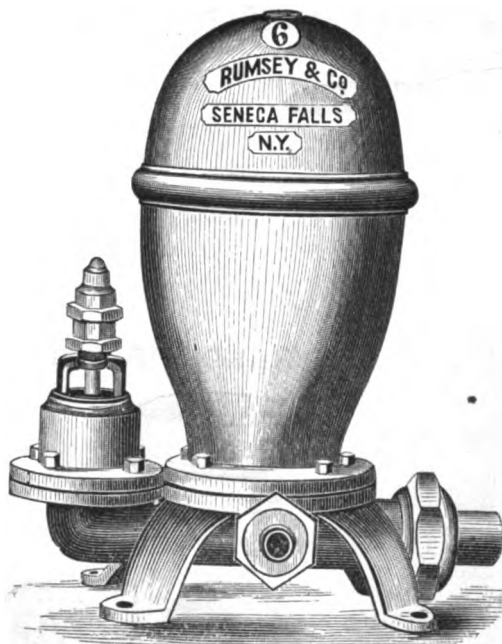


Fig. 1096

SIZES AND CAPACITIES.

Size of Ram.	Quantity of Water Furnished per minute by the Spring or Brook to which the Ram is adapted.	LENGTH OF PIPES.		CALIBRE OF PIPES	
		Drive.	Discharge	Drive.	Discharge
No. 2.....	$\frac{1}{2}$ Gal. to 2 Galls. per min.	25 to 40 feet.	To where desired.	$\frac{1}{2}$ inch.	$\frac{3}{4}$ inch.
No. 3.....	1 " 4 " "	25 to 40 "	" " "	1 " "	" "
No. 4.....	2 " 8 " "	25 to 40 "	" " "	1 $\frac{1}{2}$ " "	" "
No. 5.....	3 " 14 " "	25 to 40 "	" " "	2 " "	1 " "
No. 6.....	4 " 25 " "	30 to 40 "	" " "	2 $\frac{1}{2}$ " "	1 $\frac{1}{2}$ " "
No. 7.....	8 " 60 " "	30 to 40 "	" " "	4 " "	2 " "
No. 8.....	12 " 120 " "	30 to 50 "	" " "	6 " "	2 $\frac{1}{2}$ " "
No. 9.....	80 " 250 " "	30 to 50 "	" " "	9 " "	3 $\frac{1}{2}$ " "

DESCRIPTION.

The use of this Ram is practicable where the spring or brook is only 18 inches higher than the Ram; yet as the height increases, the more powerful the Ram operates, and its ability to force water to a greater elevation and distance is correspondingly strengthened. The relative height of the spring or source of supply above the Ram, and the elevation to which it is required to raise, determine the relative proportion between the water raised and wasted—the quantity raised varying according to the height it is conveyed with a given fall; also, the distance the water has to be conducted, and consequent length of pipes, have some influence on the quantity delivered at the point of discharge, as the more extended the pipes through which the water has to be forced by the Ram, the more friction there is to be overcome by additional efforts on the part of the machine: notwithstanding, Rams are frequently and successfully employed for driving water a distance of 100 to 200 rods, to an altitude of 100 to 200 feet above the Ram, and severer trials than these even, testify to the indispensability of this almost automatic device. A fall of 10 feet from the brook or spring to the Ram is abundantly sufficient to raise water to any point less than 150 feet above the location of the machine, while the same amount of fall will also raise water to a point considerably higher, though the supply of water will be proportionately diminished as the height and distance increases. When the requisite quantity of water is forthcoming from the Ram, operating under a certain fall, it is not judicious to give it more fall, for by so doing the strain on the machine is measurably augmented, those parts doing the labor are overtaxed, and the durability of the apparatus impaired and lessened.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

CENTRIFUGAL PUMP.

RIGHT HAND HORIZONTAL PUMP, WITH SUCTION PRIMER.

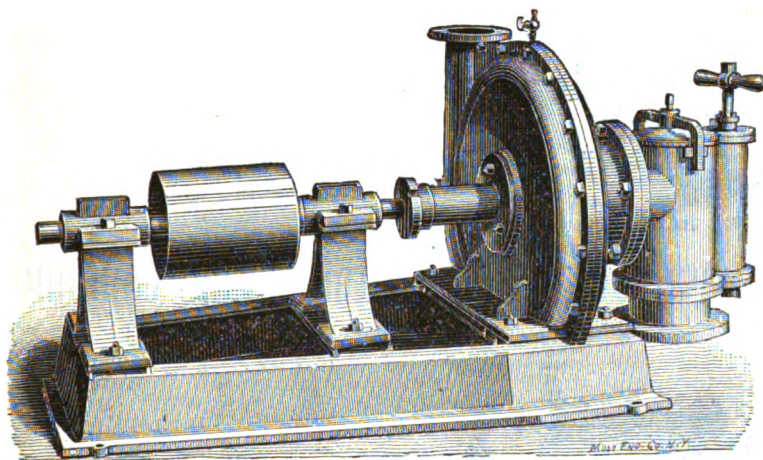


Fig. 1087.

Size of Discharge $1\frac{1}{4}$ to 22 inches.

These Pumps furnished with or without Primer as desired.

Sizes, Capacities and Speeds necessary to raise water to different heights.

REVOLUTIONS PER MINUTE.																		
No.	IN.	GALL.	IN.	Face of Pulley, IN.	REVOLUTIONS PER MINUTE.													
					5 Feet	10 Feet	15 Feet	20 Feet	25 Feet	30 Feet	35 Feet	40 Feet	50 Feet	60 Feet	70 Feet	80 Feet	90 Feet	100 Feet
1½	1½	100	5	5	626	725	828	916	1008	1081	1160	1222	1350	1465	1575	1670	1768	1865
1¾	1¾	200	5	5	598	723	819	900	975	1042	1110	1168	1282	1385	1485	1580	1675	1760
2	2	250	7	6	480	575	655	727	790	853	910	965	1063	1153	1236	1312	1360	1405
2½	2½	400	7	6	495	580	650	714	775	830	890	935	1024	1110	1190	1260	1325	1365
3	3	600	7	6	495	580	645	705	762	815	872	915	1000	1082	1155	1222	1291	1353
3½	3½	900	7	7½	587	667	745	815	875	934	986	1040	1135	1225	1307	1385	1455	1495
4	4	1,200	8	10	482	547	609	662	712	756	804	846	921	995	1058	1123	1183	1240
5	5	1,800	10	10	440	495	545	590	633	671	708	744	810	870	927	980	1033	1085
6	6	2,600	12	12	367	410	450	484	520	550	580	607	660	710	756	800	841	880
8	8	4,700	18	12	300	333	363	391	415	440	464	485	525	573	609	643	663	695
10	10	7,300	20	12	282	313	341	367	390	414	436	456	493	539	572	605	623	655
12	12	10,000	24	14	210	232	252	272	290	306	321	335	362	388	412	434	456	480
15	15	16,000	30	16	172	193	208	225	238	252	264	277	300	320	340	360	378	395
22	22	35,000	48	16	122	133	143	153	162	171	179	188	200	214	228	240	250	265

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FOR PRICES SEE ACCOMPANYING LIST.

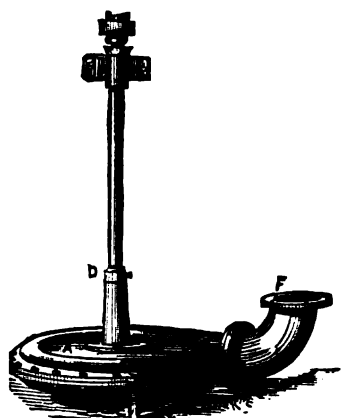


Fig. 1098.

Vertical Centrifugal Pump.

For drawing lock-pits, coffer-dams, tan-vats, &c., or for any situation requiring the removal of large quantities of water containing mud, sand, gravel, bark, &c., quickly and cheaply.

Centrifugal Pump and Steam Engine Combined.

WITH OR WITHOUT PRIMER.

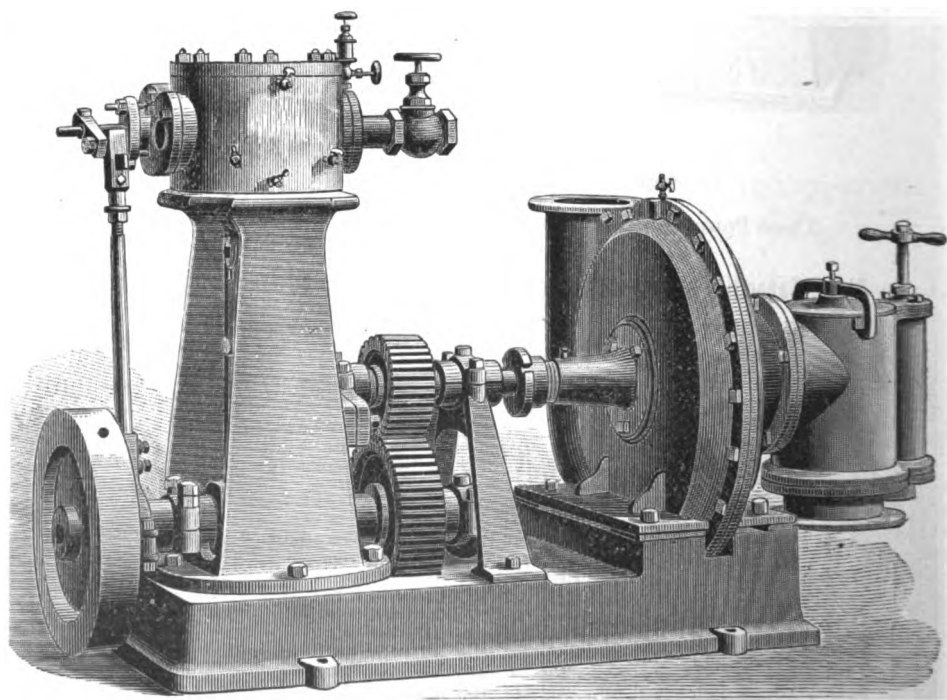


Fig. 1099.

For a low lift, we couple the engine and pump direct, instead of using gearing.

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FOR PRICES SEE ACCOMPANYING LIST.

BLAKE'S BOILER FEED PUMP.

HAND POWER LEVER DETACHED.

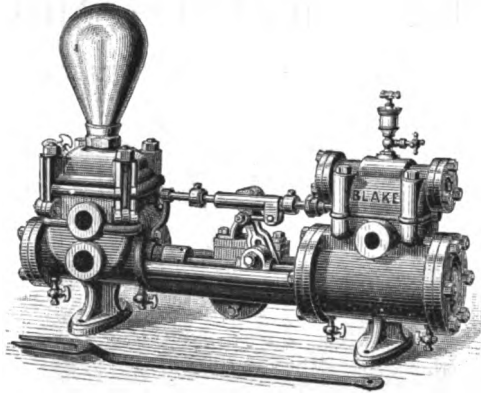


Fig. 1100.

This cut represents Size No. 3, with Hand Power Attachment.

LIST OF SIZES.

No.	Steam Cylinder.	Water Cylinder.	Stroke.	Gall's per Stroke.	*Capacity per Minute At Ordinary Speed.	Steam Pipe.	Ex- haust Pipe.	Suction Pipe.	Deliv- ery Pipe.	Floor Space Required.
000	2½	1½	3	.023	150 Strokes, 3½ Gals.	1½	¾	1½	¾	17 x 5
00	3	1¾	3	.031	150 " 4½ "	1½	¾	1½	¾	18 x 5
0	3½	2½	3	.04	150 " 6 "	1½	¾	1	¾	24 x 6
1½	4	2¾	5	.10	150 " 15 "	1½	¾	1½	1	37 x 8
2½	4½	2¾	6	.15	150 " 22 "	1½	¾	1½	1	37 x 8
3	5½	3½	7	.25	125 " 31 "	1½	¾	1½	1½	41 x 9
4	6	3¾	7	.33	125 " 42 "	1½	¾	2	1½	41 x 10
4½	6½	4½	8	.46	125 " 58 "	1½	1½	2½	2	48 x 10
5	7½	4½	10	.69	100 " 69 "	1	1½	2½	2	52 x 11
6	8	5	10	.85	100 " 85 "	1	1½	3	2½	58 x 12
6½	8	5	12	1.02	100 " 102 "	1	1½	3½	3	64 x 15
7	10	6	12	1.47	100 " 147 "	1½	2	3½	3	66 x 15
8	12	7	12	2.00	100 " 200 "	1½	2½	5	4	66 x 16
9	14	8	12	2.61	100 " 261 "	2	3	5	4	66 x 18
10	16	9	18	4.96	70 " 347 "	2	3	8	6	98 x 28
10½	16	10	24	8.16	50 " 408 "	2	3	8	6	116 x 28
11	18	12	24	11.75	50 " 588 "	2½	3½	10	8	125 x 28
12	20	14	24	16.00	50 " 800 "	3	4	10	8	125 x 28

LARGER SIZES TO ORDER.

* Twice the above capacities can be had in emergencies; but for continuous work, such as boiler-feeding, we advise about half the speeds stated.

Every Pump has suction and delivery openings on both sides; consequently, connections can be made on either side desired. When ordering a pump, please answer the following questions:

1st. Whether for hot or cold water? 2nd. To what height is water to be lifted by suction? 3d. Length of suction pipe? 4th. Against what pressure or height is water to be forced? 5th. Amount of water needed per hour? The Nos. 0, 1½, 2½, 3, 4 and 4½ pumps are provided with hand power attachments.

THE UTILITY OF THE PATENT HAND POWER ATTACHMENT

Will be seen at once, as the pump can be used, when steam is down, for filling boilers after "blowing off," washing decks, fire purposes, &c. The Hand Lever can be instantly removed by simply lifting it from the pin on which it rests.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

KNOWLES' PATENT Boiler Feeding AND Heavy Pressure Pumps,

ARRANGED FOR EITHER HOT OR COLD WATER.

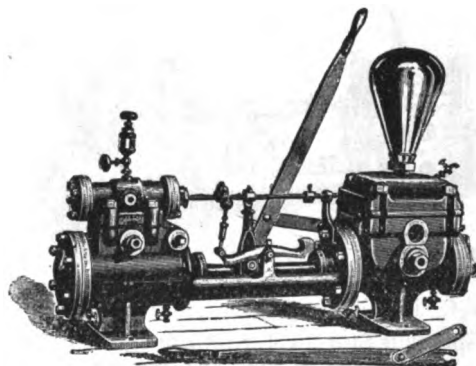


Fig. 1101.

Cut above represents regular Boiler Feed Pump, Nos. 3 and 4. Showing New Patent Valve Motion, and Hand Power Lever Attached and Detached.

INDEPENDENT DIRECT ACTING STEAM PUMPS have a special advantage in Boiler Feeding, inasmuch as speed can be adjusted automatically, or otherwise, to run continuously, and maintain water at uniform height.

These Pumps can safely be run at speed that makes them an efficient Fire Pump.

LIST OF REGULAR SIZES.

No.	Diameter Steam Cylinder.	Diameter Water Cylinder.	Length of Stroke.	Gallons per Stroke	Strokes per Min.	Steam Pipe.	Exhaust Pipe.	Suction Pipe.	Discharge Pipe.
000	2½	1½	3	.02	1 to 350	½	¾	1½	¾
00	3	1¾	3	.03	1 to 350	1	¾	1½	¾
0	3½	2	4	.05	1 to 300	1½	¾	1½	1
1	3½	2½	4	.07	1 to 300	1½	¾	1½	1
2	4	2½	5	.11	1 to 300	1½	¾	1½	1
3	5	3½	7	.25	1 to 275	1	1	2	1½
4	5½	3½	7	.34	1 to 275	1	1	2	1½
4½	7	4	7	.39	1 to 275	1	1½	2½	2
5	7	4½	10	.69	1 to 250	1	1½	3	2½
6	7½	5	10	.85	1 to 250	1	1½	3	2½
6½	8	5	12	1.02	1 to 250	1	1½	4	4
7	10	6	12	1.46	1 to 200	1½	1½	4	4
8	12	7	12	1.99	1 to 200	2	2½	5	5
9	14	8	12	2.61	1 to 200	2	2½	5	5
10	16	10	16	5.43	1 to 200	2½	3	6	6
11	18	12	24	11.75	1 to 180	3½	4	8	6
12	20	14	24	15.99	1 to 180	3½	4	10	8
13	24	16	24	20.79	1 to 150	4	4½	12	10
14	30	18	24	26.43	1 to 150	5	6	14	12

Larger Sizes on hand or Made to Order at Short Notice.

THESE PUMPS ARE LINED WITH COMPOSITION (GOVERNMENT STANDARD) WHEN USED TO PUMP LIQUIDS REQUIRING IT.

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FOR PRICES SEE ACCOMPANYING LIST.

ARTESIAN WELL PUMPS.

VERTICAL BUCKET-PLUNGER PATTERN.

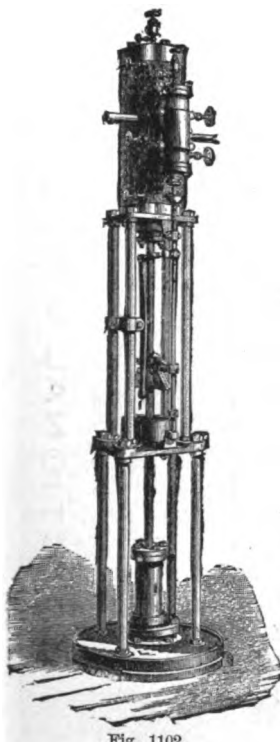


Fig. 1102.

The action of the Pump is fully controlled by a perfected arrangement of the Steam Valves, making the up and down strokes equally uniform and regular.

The Bucket, as shown in Fig. 1103, is placed down the Well and discharges water on the up stroke. The upper Plunger discharges on the down stroke, thus making the flow of water uniform and the Pump virtually double-acting.

The lower Pump Chamber or working Barrel is made of the hardest phosphor-bronze composition (not soft brass tubing) carefully finished. The Pump Bucket and Foot Valve are carefully fitted and can be readily drawn up through the tubing for examination or repairs. The base and centre connection of the steam end form convenient drip-pans; the entire design combines elegance with greatest

STRENGTH, DURABILITY AND EFFICIENCY.

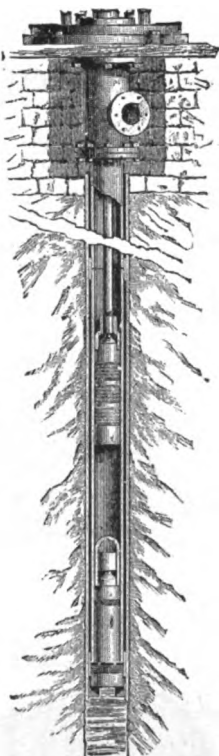


Fig. 1103.

Will Successfully Raise Water from Wells 200 to 2000 feet deep.

LIST OF REGULAR SIZES.

Number.	Steam Cylinder.	Bucket.	Plunger.	Stroke.	Steam Pipe.	Exhaust Pipe.
1	6	2 to 2½	1½ to 2	7	½	1
2	6	2½ to 3½	2 to 2½	7	½	1
3	6	3½ to 4½	2½ to 3½	7	½	1
4	8	2 to 3	1½ to 2½	24	1	1½
5	8	3 to 4	2½ to 3	24	1	1½
6	8	4 to 5	3 to 3½	24	1	1½
7	10	2 to 3	1½ to 2½	24	1½	1½
8	10	3 to 4	2½ to 3	24	1½	1½
9	10	4 to 5	3 to 3½	24	1½	1½

Estimates given for larger sizes or other combinations.

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FOR PRICES SEE ACCOMPANYING LIST.

The "Deane" Patent Steam Pump.

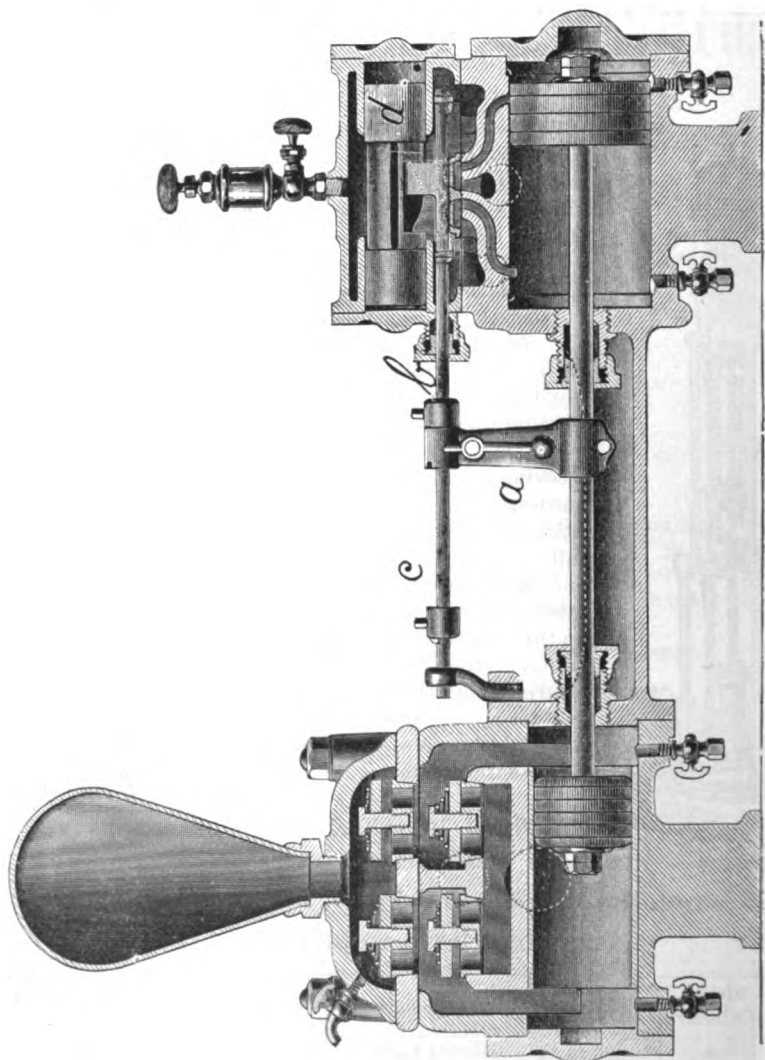


Fig. 1104.

SECTIONAL VIEW.

In the DEANE PATENT STEAM PUMP, the tappit arm *a* which is carried by the piston rod, comes in contact with the tappit *b*, when near the end of its motion, and, by means of the valve rod *c*, moves the small slide valve which operates the supplemental piston *d*. The supplemental piston, CARRYING WITH IT THE MAIN VALVE, is thus driven over by steam, and the engine reversed. If, however, the supplemental piston falls accidentally to be moved, or to be moved with sufficient promptness by steam, the lug *e* on the valve rod engages with it and COMPELS its motion by power derived from the main engine.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

The "Deane" Patent Steam Pumps

FOR FEEDING BOILERS OR FORCING WATER UNDER
HEAVY PRESSURE.

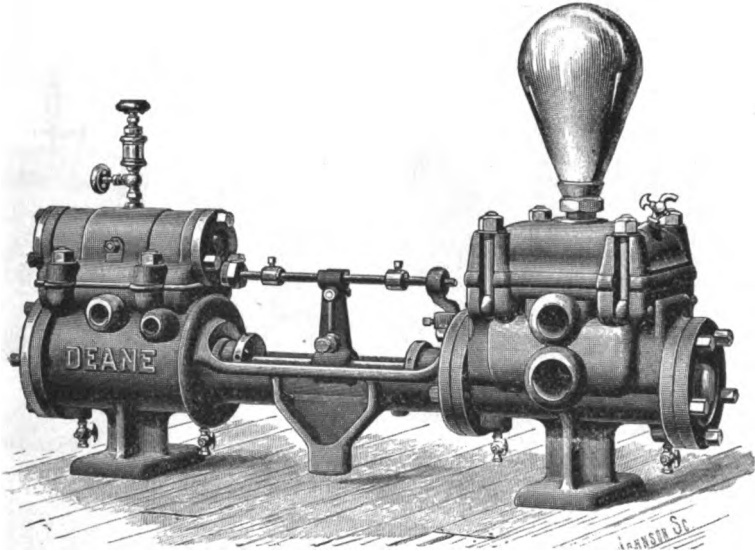


Fig. 1105.

LIST OF REGULAR SIZES.

Number.	Diam. of Steam Cylinder, inches	Diam. of Water Cylinder, inches	Length of Stroke in inches.	Gallons per Stroke.	Strokes per Minute.	Capacity per Minute at Ordinary Speed.		Extreme Length in inches.	Extreme Width in inches.	Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Suction.	Size of Discharge.
						150 Strokes,	9 galls.						
0	8	2	5	.06	1 to 300	150	9	29½	7	1	2	1½	1
1	8½	2½	5	.08	1 to 300	150	12	30	7½	1	2	1½	1
2	9	3	5	.11	1 to 300	150	16	30	8	1	2	1½	1
3	4	3½	7	.25	1 to 275	125	81	42	9	1	2	2	1½
4	5	4	7	.34	1 to 275	125	42	42	9	1	2	2	1½
5	5½	4½	8	.49	1 to 275	120	58	50	11½	1	2	2	2
6	7	5	10	.69	1 to 250	100	69	54	11½	1	2	2	2
7	7½	5½	10	.85	1 to 250	100	85	54	11½	1	2	2	2
8	8	6	12	1.02	1 to 250	100	102	63	12	1	2	2	2
9	10	6	12	1.47	1 to 200	100	147	64	14½	1½	2	4	4
10	12	7	12	2.00	1 to 200	100	200	64	16½	2	2	5	5
11	14	8	12	2.61	1 to 200	100	261	64	18	2	2	5	5
12	16	10	16	5.43	1 to 200	80	434	81	22	2	2	8	8
13	18	12	24	11.75	1 to 180	50	587	111	22	3	3	10	10
14	20	14	24	15.99	1 to 180	50	799	112	34	3	3	12	12
15	24	18	24	26.43	1 to 150	50	1321	112	40	4	4	14	14
16	30	22	24	39.49	1 to 150	50	1974	114	45	4½	4½	18	18

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FOR PRICES SEE ACCOMPANYING LIST.

The "Deane" Patent Light Service or Tank Pump.

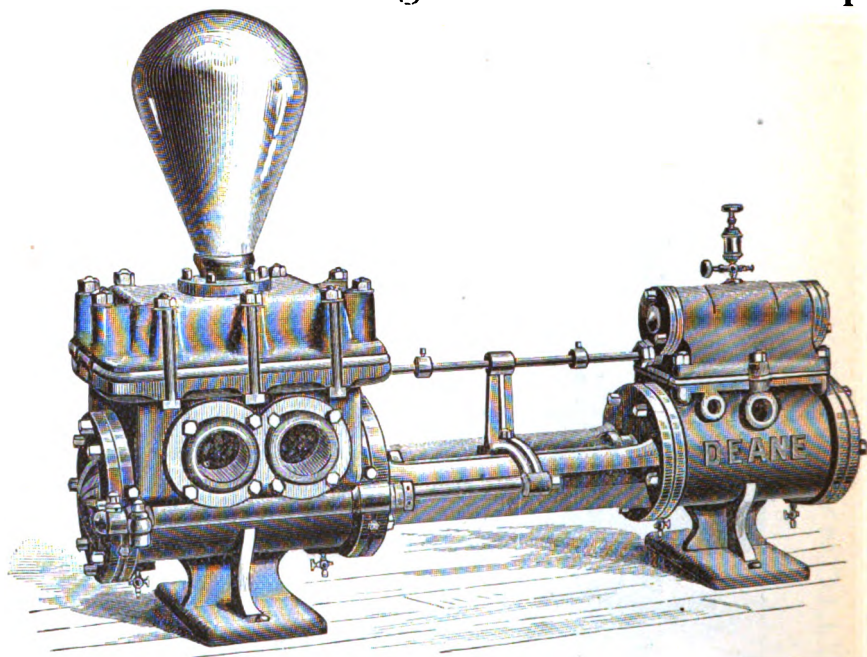


Fig. 1106.

LIST OF SIZES.

Number.	Diam. of Steam Cylinder, inches.	Diam. of Water Cylinder, inches.	Length of Stroke in inches.	Gallons per Stroke.	Strokes per Minute.	Capacity per Minute at Given Speed.	Extreme Length in inches.	Extreme Width in inches.	Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Section.	Size of Discharge.
1	4	3½	5	.14	1 to 800	130 Strokes, 18 galls.	31	9½	1	1	2	1
2	4	4	5	.27	1 to 300	130 "	31	9½	1	1	2	1
3	4	4	7	.39	1 to 300	125 "	42	12	1	1	3	2
4	5	5	7	.51	1 to 275	125 "	42	12	1	1	3	2
5	5½	5½	7	.72	1 to 275	125 "	42	12	1	1	3	2
6	5½	5½	7	1.04	1 to 250	110 "	56	15	1	1	5	4
7	7	7	10	1.91	1 to 250	110 "	56	15	1	1	5	4
8	7	7	10	2.17	1 to 250	110 "	56	15	1	1	5	4
9	8	8	12	1.47	1 to 250	100 "	63	18	1	1	5	4
10	8	8	12	2.00	1 to 250	100 "	63	18	1	1	5	4
11	8	8	12	2.61	1 to 250	100 "	63	16	1	1	5	4
12	8	10	12	4.08	1 to 250	100 "	64	24	1	1	8	6
13	10	8	12	2.61	1 to 250	100 "	63	16	1½	2	5	5
14	10	10	12	4.08	1 to 250	100 "	64	24	1	2	8	6
15	10	12	12	5.87	1 to 250	100 "	64	24	1½	2	8	6
16	12	10	12	4.08	1 to 250	100 "	64	24	2	2	8	6
17	12	10	18	6.12	1 to 200	70 "	98	25	2	2	8	6
18	12	12	12	5.87	1 to 250	100 "	64	24	2	2	8	6
19	12	12	18	8.80	1 to 175	70 "	88	27	2	2	8	6

DIMENSIONS, ETC., OF LARGER SIZES ON APPLICATION.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE "DEANE" STEAM FIRE PUMPS.

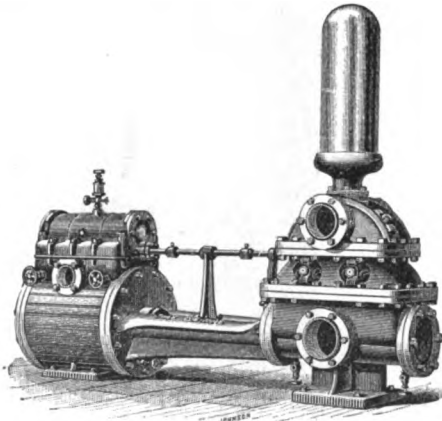



Fig. 1107.

LIST OF THE "DEANE" STEAM FIRE PUMP.

Number.	Diam. of Steam Cylinder, inches	Diam. of Water Cylinder, inches	Length of Stroke in inches.	Gallons per Stroke.	Strokes per Minute.	Capacity per Minute at Ordinary Speed.	Extreme Length in Inches.	Extreme Width in Inches.	Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Suction.	Size of Discharge.
1	7 $\frac{1}{2}$	4	10	.55	1 to 250	180 galls.	54	11 $\frac{1}{2}$	1	1 $\frac{1}{2}$	Two 3	Two 3
2	10	5	12	1.02	1 to 250	205 "	63	12	1 $\frac{1}{2}$	2	" 3	" 2 $\frac{1}{2}$
3	12	5	12	1.02	1 to 250	205 "	63	12	2	2 $\frac{1}{2}$	" 3	" 2 $\frac{1}{2}$
4	12	6	12	1.47	1 to 250	300 "	64	14 $\frac{1}{2}$	2	2 $\frac{1}{2}$	" 4	" 4
5	14	6	12	1.47	1 to 250	300 "	64	14 $\frac{1}{2}$	2	2 $\frac{1}{2}$	" 4	" 4
6	14	7	12	2.00	1 to 250	400 "	64	16 $\frac{1}{2}$	2	2 $\frac{1}{2}$	" 5	" 4
7	12	6	16	1.96	1 to 250	375 "	77	16	2	2 $\frac{1}{2}$	Two 5	Two 5
8	14	6	16	1.96	1 to 250	375 "	77	16	2	2 $\frac{1}{2}$	" 5	" 5
9	14	7	16	2.66	1 to 250	475 "	77	18	2	2 $\frac{1}{2}$	" 5	" 5
10	16	8	16	3.50	1 to 200	500 "	85	23 $\frac{1}{2}$	2	2 $\frac{1}{2}$	" 6	" 5
11	16	8	18	3.91	1 to 200	525 "	89	23 $\frac{1}{2}$	2	2 $\frac{1}{2}$	" 6	" 5
12	16	8	24	5.23	1 to 200	550 "	105	24	2	2 $\frac{1}{2}$	" 6	" 5
13	18	8	18	3.91	1 to 200	525 "	89	23 $\frac{1}{2}$	3	3 $\frac{1}{2}$	" 6	" 5

LARGER SIZES OR DIFFERENT PROPORTIONS TO ORDER.

 When ordering Fire Pumps, please answer the following questions: 1. Is the water salt or fresh? 2. What is the area to be protected? 3. What is the height of the highest building to be protected? 4. How many feet and what size of main do you propose to put in? 5. How many streams will be required at any one time? 6. How high must the water be lifted by suction; 7. What is the extreme length of suction pipe? 8. What is the minimum pressure of steam used?

ALL KINDS OF FIRE SUPPLIES, SUCH AS HOSE, COUPLINGS, NOZZLES, ETC.,
FURNISHED AT MANUFACTURERS' PRICES.

Designs and Estimates furnished on application for *complete apparatus* for towns, villages, and manufacturing establishments contemplating fire protection.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

The "Deane" Pump and Boiler Combined.

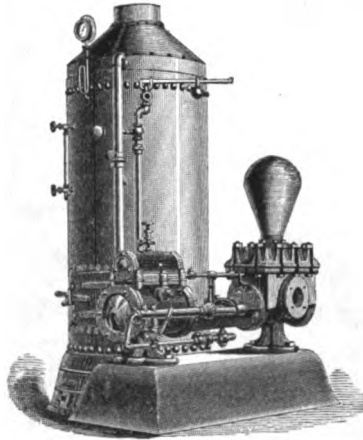


Fig. 1108.

List of Regular Sizes of The "Deane" Combined Pumps and Boilers.

DIMENSIONS OF STEAM PUMPS.										DIMENSIONS OF BOILERS.				Weight ready for Shipping.
Number.	Diam. of Steam Cylinder, inches	Diam. of Water Cylinder, inches	Length of Stroke in inches.	Gallons per Stroke.	Capacity per Minute at Ordinary Speed.		Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Suction.	Size of Discharge.	Diameter of Shell.	Height of Shell.	Number of Tubes.	
0	3	2	5	.06	Stks.	Gals.			1½	1	20	48	20	1250
1	3½	2½	5	.08	150	9	1½	1½	1½	1	20	48	20	1800
2	4	3	5	.11	150	12	1½	1½	1½	1	20	48	20	1800
3	4½	3½	7	.25	125	31	1	1	2	1½	24	60	25	1800
4	5	3¾	7	.34	125	42	1	1	2	1½	24	60	25	1800
4½	5½	4½	8	.49	120	58	1	1½	3	2	30	60	60	2750
5	7	4½	10	.69	100	69	1	1½	3	2	30	60	60	2800
6	7½	5	10	.85	100	85	1	1½	3	2	30	60	60	2800
6½	8	5	12	1.02	100	102	1	1½	3	2½	30	60	60	3000
7	10	6	12	1.47	100	147	1½	2	4	4				
8	12	7	12	2.00	100	200	2	2½	5	4				
Tank Pumps.														
10	4	4	5	.27	130	35	1½	2	2	1½	20	48	20	1925
11	5½	5½	7	.72	120	86	1½	1	3	2	24	60	25	2000
12	7	7	10	1.66	110	180	1	1½	4	4	30	60	60	3200
13	8	6	12	1.47	100	147	1	1½	4	4	30	60	60	3300
14	8	7	12	2.00	100	200	1	1½	5	4	30	60	60	3350
15	8	8	12	2.61	100	261	1	1½	5	5	30	60	60	3450

Prices of Larger Sizes on Application.

Every Machine Sold under full Guarantee.

In ordering, please answer the following questions: 1. For what purpose is the pump to be used? 2. If not water, what is the liquid, or semi-liquid, to be pumped? 3. If water, is it hot or cold, salt or fresh, clear or gritty? 4. What is the maximum quantity required to be pumped per hour? 5. To what height is it to be lifted by suction? and to what height forced? 6. What is the whole length of suction-pipe? and what is the extreme length of discharge-pipe? 7. What is the ordinary pressure of steam used?

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE "DEANE" PATENT DOUBLE PLUNGER PUMP.
FOR MINING USE.

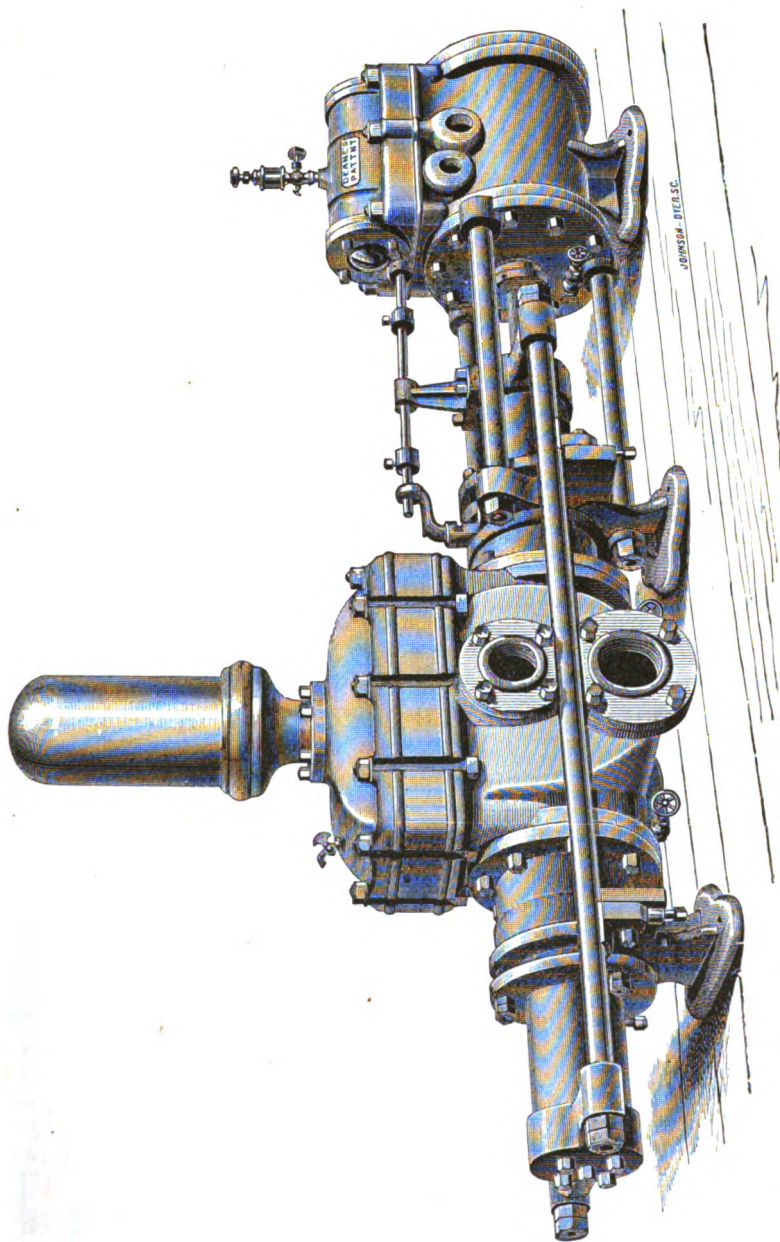


Fig. 1109.

The larger sizes have a very heavy box bed.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

DESCRIPTION OF THE “Deane” Patent Double Plunger Pump, FOR MINE USE.

Notwithstanding the fact that the Direct-Acting Pumping Machinery for draining mines

COSTS MUCH LESS

Than any other style, a prejudice exists against its employment on account of the concussion—so destructive to pipes and connections—that attends the use of improperly designed and constructed machines. This is entirely obviated in

The Deane Patent Mining Pump

By applying a simple cushion (first used on these pumps) to the steam cylinder, compelling the piston to stop and start slowly at the end of each stroke, so that the water valves may

HAVE TIME TO SEAT QUIETLY AND CAUSE NO SHOCK OR JAR.

THE DEANE STEAM VALVES

Have a straight mechanical connection with the main piston ; they are the most simple and readily understood of any ; they are absolutely positive with steam, water or air.

THEY WILL WORK WITH CERTAINTY WHEN ENTIRELY SUBMERGED.

THE EXHAUST CAN BE CARRIED INTO A $\frac{1}{2}$ CONDENSER,

Thus ridding the mine of the annoyance of escaping steam, and adding to the efficiency of the pump at a small cost.

DIMENSIONS OF DOUBLE-ACTING PLUNGER PUMPS.

Number.	Diam of Steam Cylinder, inches	Diameter of Plunger, inches.	Length of Stroke in inches.	Gallons per Stroke.	Strokes per Minute.	Capacity per Minute at Ordinary Speed.		Weight ready for Shipping.	Extreme Length in inches.	Extreme Width in inches.	Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Suction.	Size of Discharge.
						Stks.	Ga's.							
1	7 $\frac{1}{2}$	4	10	.55	1 to 250	100	55	1050	88 $\frac{1}{2}$	14	1	1 $\frac{1}{2}$	4	3
2	8	4 $\frac{1}{2}$	10	.69	1 to 250	100	69	1100	88 $\frac{1}{2}$	14	1	1 $\frac{1}{2}$	4	3
3	8	5	10	.83	1 to 200	100	85	1150	88 $\frac{1}{2}$	14	1	1 $\frac{1}{2}$	4	3
4	8	4 $\frac{1}{2}$	12	.97	1 to 200	100	97	1200	98	14	1	1 $\frac{1}{2}$	4	3
5	8	5	12	1.02	1 to 200	100	102	1250	98	19	1	1 $\frac{1}{2}$	4	3
6	10	5	12	1.02	1 to 200	100	102	1600	98	19	1 $\frac{1}{2}$	2	4	3
7	10	6	12	1.46	1 to 200	100	146	2015	98 $\frac{1}{2}$	19 $\frac{1}{2}$	2	2 $\frac{1}{2}$	4	3
8	12	6	12	1.46	1 to 200	100	146	2230	98 $\frac{1}{2}$	19 $\frac{1}{2}$	2	2 $\frac{1}{2}$	4	3
9	12	7	12	1.99	1 to 200	100	199	2310	98 $\frac{1}{2}$	20 $\frac{1}{2}$	2	2 $\frac{1}{2}$	6	4
10	14	7	12	1.99	1 to 200	100	199	2420	98 $\frac{1}{2}$	21	2	2 $\frac{1}{2}$	6	4
11	14	8	12	2.61	1 to 200	100	261	2550	99	21	2	2 $\frac{1}{2}$	6	4

DIMENSIONS, ETC., OF LARGER SIZES ON APPLICATION.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

POAGE'S AUTOMATIC WATER COLUMN.

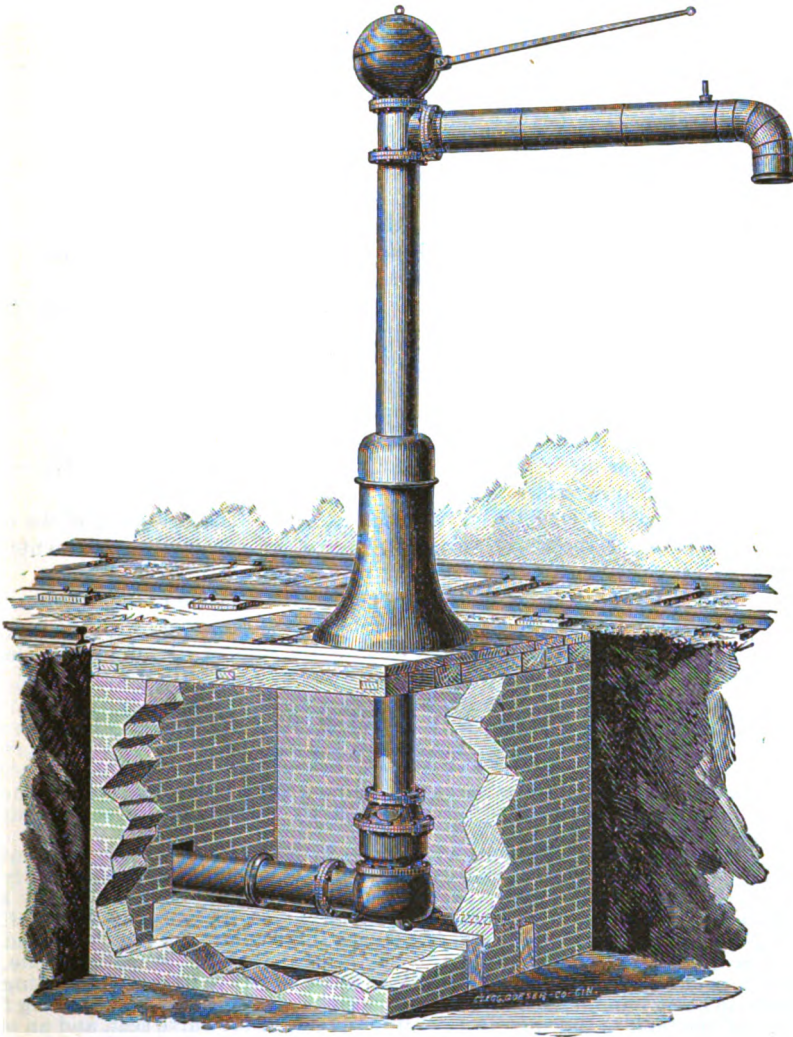


Fig. 1110.

IN ORDERING PLEASE STATE :

- 1st. Whether 8-inch or 6-inch size is wanted.
- 2d If the standard lengths below are not suitable, state what changes are desired.
- 3d. State whether an ordinary TANK PRESSURE, or a WATER-WORKS pressure is used, and, if the latter, give the pressure to the square inch.

STANDARD LENGTHS :—From centre of inlet pipe to upper side of flooring, 4 ft. 3 in.; from top of rail to bottom of discharge pipe, 9 ft. 2 in.; from centre of column to centre of discharge elbow, 7 ft. 9 in.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

POAGE'S AUTOMATIC WATER COLUMN.

DESCRIPTION.

ITS AUTOMATIC ROTATION.—The column rotates in its supporting pedestal, and is actuated by gravity to return to its normal position after use, with its discharge spout in line with the track. In consequence, no danger can possibly ensue to passing trains. The devices for this purpose are simple in construction, and positive and certain in operation. It also saves time, as it is within reach of the fireman when the train stops, and the train may be started the instant the tank is filled without any of the ordinary delays.

WORKING PARTS AND VALVES ARE PERFECTLY PROTECTED by being all arranged within the column. The operating lever alone is exposed, but is situated above the column and so connected as to be entirely inoperative except when the column is swung around for use. Thus the column can not be tampered with or injured by tramps.

THE RE-SEATING OF THE VALVE, after use, is controlled and cushioned by the water pressure, and no skill is required to operate it. All injury to the parts by too sudden action of the valve is thus prevented.

NO INJURY FROM FROST CAN ENSUE, as the column is thoroughly and quickly drained after use, and the pipe and valve emptied by a drain valve, which may be disconnected in mild weather.

DURABILITY OF WORKING PARTS SECURED.—The re-seating of the main valve, the opening of the waste valve, and all other automatic movements, are attained by gravity alone.

ITS SIMPLICITY.—It has but two motions: 1st, the rotation of the column; 2nd, the rising and falling of the rod. The two valves move positively with the rod, and the piston, which is a part of the rod, graduates the time of its falling and closing the valve.

POAGE'S TANK VALVE, with Universal Joint and Telescopic Pipe.

DESCRIPTION.

It is raised and lowered the same as the common Tank Valve, and may be moved around laterally; is lengthened or shortened by drawing out or shoving in the Telescopic Pipe.

It has a perfect Universal Joint, which is made tight with heavy moulded rubber packing. This construction obviates the necessity of bringing the train exactly opposite to the spout. The Valve is provided with a Gun Metal Seat and Heavy Rubber Packing. The Valve Rod connects with the Valve with balljoint, which allows the Valve to adjust itself to the seat, making a tight joint. On the Valve Rod is a piston, working in a cylinder formed in the central part of the valve frame. It acts as a guide, and also causes the valve to settle slowly to its seat, preventing the valve from being hammered out by sudden closing. A vacuum Pipe, extending from the top of the tank to the valve, screws into the side of the valve seat, and an opening communicates with the inner part of the valve under the valve plates, preventing the formation of a vacuum upon the shutting off of the water. In setting up have the point where the chain passes from the spout into the sheave wheel directly over the swivel.

THE SPOUTS ARE GALVANIZED.

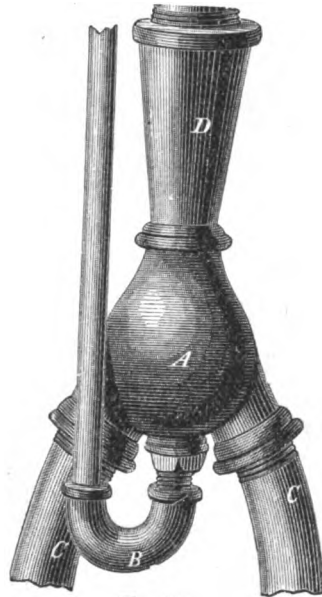
An order for a Tank Valve includes: Cast Iron Spout, Wrought Iron Spout (galvanized), Valve complete with Bolts, Rod and Weights, three Balls and Chains, Vacuum Pipe, Lever and Fulcrum, set of Sheaves, making the apparatus complete as per cut.

In order to have these Tank Valves perfect, we sell them complete in all cases.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Lansdell's Steam Syphon Pump.



A, Body of Syphon

B, Steam Pipe.

C. C. Suction Pipe.

D. E. Discharge Pipe.

Fig. 1111.

OPERATION.

Steam is turned on through the steam pipe B, and rushes across the globular chamber A into D, carrying the air in A and D before it, thereby exhausting the air from A. Water to supply its place rises through the suction pipes C, C, from atmospheric pressure, as in ordinary suction pumps, when the steam jet forces it onward through D, E, with a velocity proportioned to the pressure in the steam boiler. Made for either high or low pressure.

SIZES.

No.	Diameter of Discharge.	Capacity in gallons Per Minute.
1	Double Suction.	15
2		30
3		50
4		120
5		200
6		320
7		450
8		800
9		1800
10	Single suction, 1½	60

PORTABLE RAILWAY SYPHON.

For supplying locomotive tenders from any body of water within reach near the side of the road.

No. 1. Will supply ordinary size of tender in from 10 to 12 minutes.

No. 2. Will supply ordinary size of tender in from 6 to 8 minutes.

Either size furnished with from 25 to 50 feet of steam and discharge hose, as desired.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE BRIGGS LATHE.



Fig. 1112.

No. 1. This lathe will turn a piece of wood or metal 12 inches long and 6 inches in diameter. It can be used with equal advantage for Drilling, Polishing, Sawing, etc. The length of bed is 24 inches; the spindle is made of steel, has a conical bearing, and can be tightened as it wears. The bed, head, tail-stocks, and cone-pulley are of cast iron and the centres of steel. The following pieces are furnished with the lathe: 2 T rests, 1 face plate, 2 plain centres, 1 spur centre for wood, 1 plain drill-chuck, 1 drill-pad, and 1 centre left blank to turn down as a fitting for a universal chuck. The bench weighs 81 pounds, is made of iron, with a black-walnut top, and has a driving-wheel measuring 22 inches in diameter, with three grooves for changes of speed.

No. 2 Lathe is the same as No. 1, excepting the body, which is 30 inches long.

No. 3 Lathe is the same as No. 1, excepting the body, which is 33 inches long.

Furnished with or without table.

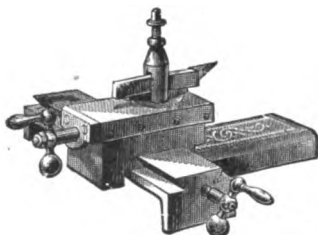


Fig. 1113.

SLIDE REST.

This Slide Rest, like the lathe, is highly finished in all the working parts and is first-class in every respect. It is suitable for Lathes of 6 inches swing, has a longitudinal motion of 4 inches and traverse motion of 2 inches. Also made suitable for Lathes of 8 inches swing. We also make a cheaper Slide Rest for Lathes 5 to 6 inches swing.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

COMBINATION LATHE.

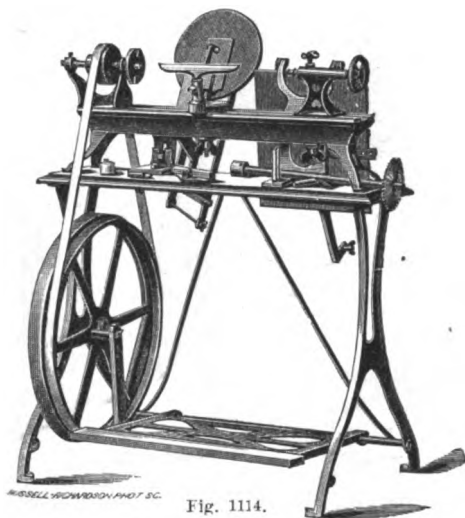


Fig. 1114.

This cut represents our No. 1 Combination Lathe in position for turning, with Sawing Attachments thrown back. It swings 8 inches and turns 18 inches between centres.

The machine consists of a thoroughly built Foot Lathe with Scroll Saw and Circular Saw attachments, so attached as to be entirely out of the way, yet ready for use at once when desired. We make two sizes, the No. 2 being the same as the No. 1, except that the Lathe bed is 18 inches longer.

Our Lathe is designed to run by foot power, but we have sold a great many to be run by steam, and we will furnish counter shafts in place of the foot motion if desired. We also furnish them without the Saw attachment, and put on back gears when desired.

LATHE TOOLS carefully made from best tool steel.

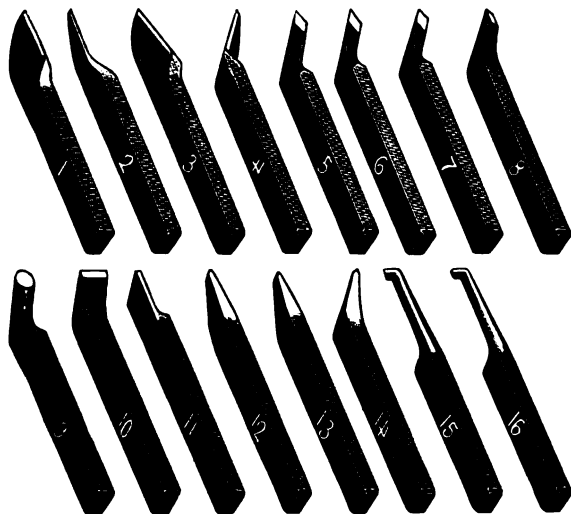


Fig. 1115.

1. Left Side Tool.
2. Right Side Tool.
3. Left Side Tool, bent.
4. Right Side Tool, bent.
5. Heavy Diamond Point for Cast Iron.
6. Diamond Point for Steel and Wrought Iron, right hand.
7. Diamond Point for Steel and Wrought Iron, left hand.
8. Half Diamond Point.
9. Round Nose.
10. Water Finishing Tool.
11. Cutting Off Tool.
12. Roughing Tool.
13. Thread Tool.
14. Bent Thread Tool.
15. Inside Turning Tool.
16. Inside Thread Tool.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

FOOT POWER HAND LATHE.

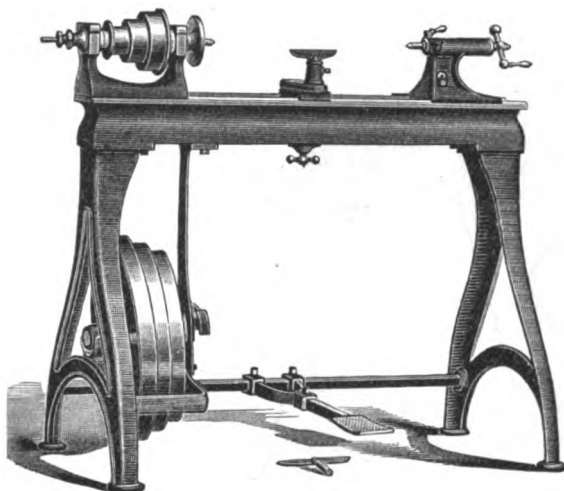


Fig. 1116.

Furnished with back gears, if desired.

SIZES.

No.	Swing.	Length of bed.	Turn in length.
1,	10 in.	3½ ft.	26 in.
2,	10 "	4½ "	38 "
3,	12 "	4 "	28 "
4,	12 "	5 "	40 "

HAND LATHE—For Power.

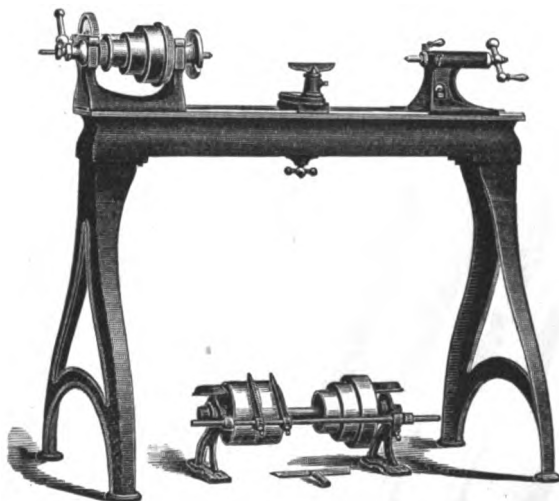


Fig. 1117.

Sizes same as above.

These Lathes are made from entirely new patterns, and have been designed to meet the demand for a **STIFF STRONG Drill Lathe**. The **Head Spindle** is hollow, and has large bearings, and the **Step Screw** is made the full size of the back bearing to give a solid step for drilling. The **Plain Lathe** has Cone for four, and the **Back Geared and Foot Lathes** three changes. The back gears give one revolution of the spindle to five of the cone, giving ample power for counter-boring, &c.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

SPEED LATHE.

WITH HOLLOW SPINDLE.

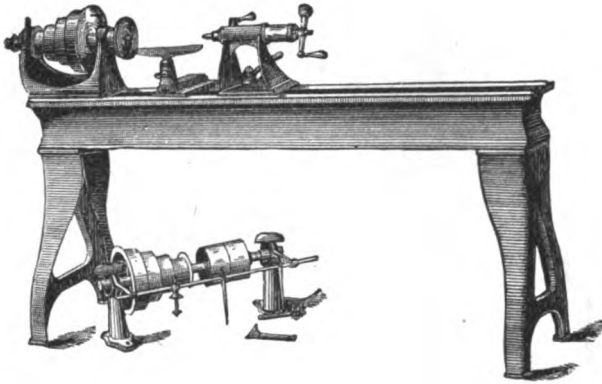


Fig. 1118.

In this lathe the Spindles, and Screw in Tail Spindle, are of Steel, the Bearings on Head Spindle being ground, and the Boxes (which are of hard cast iron), carefully scraped. The Cone (which is bored inside to insure perfect balance), has Four Changes of Speed for $2\frac{1}{4}$ inch Belt. The Rest Holder sits on a plate fitted to the ways, and is readily and securely fastened with a Cam Lever at the back, within easy reach of the operator. We furnish with each machine a Countershaft, with Iron Cone, Tight and Loose Pulleys, etc., all complete, also three Rests for Hand Turning and one for Chucking.

DIMENSIONS.—Swing, 16 inches; Length of Bed, 6 feet; Distance between Centres, 8 feet 10 inches; Length of Head Spindle, $16\frac{1}{2}$ inches; Hole in Spindle, $\frac{9}{16}$ of an inch; Weight, 530 pounds.

SLIDE REST.

For 10 and 12 Inch Lathes.

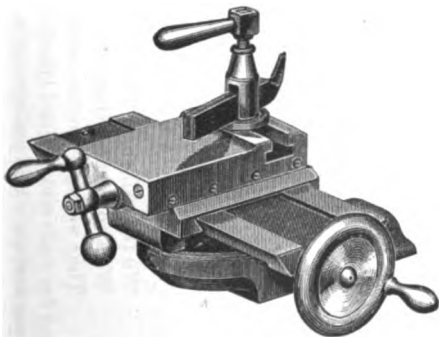


Fig. 1119.

DIMENSIONS :

No.	Length.	Cross Feed.
10	9 inches.	2 inches.
12	12 "	$2\frac{1}{4}$ "

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Wood Turning Lathe for Pattern Makers' Use.

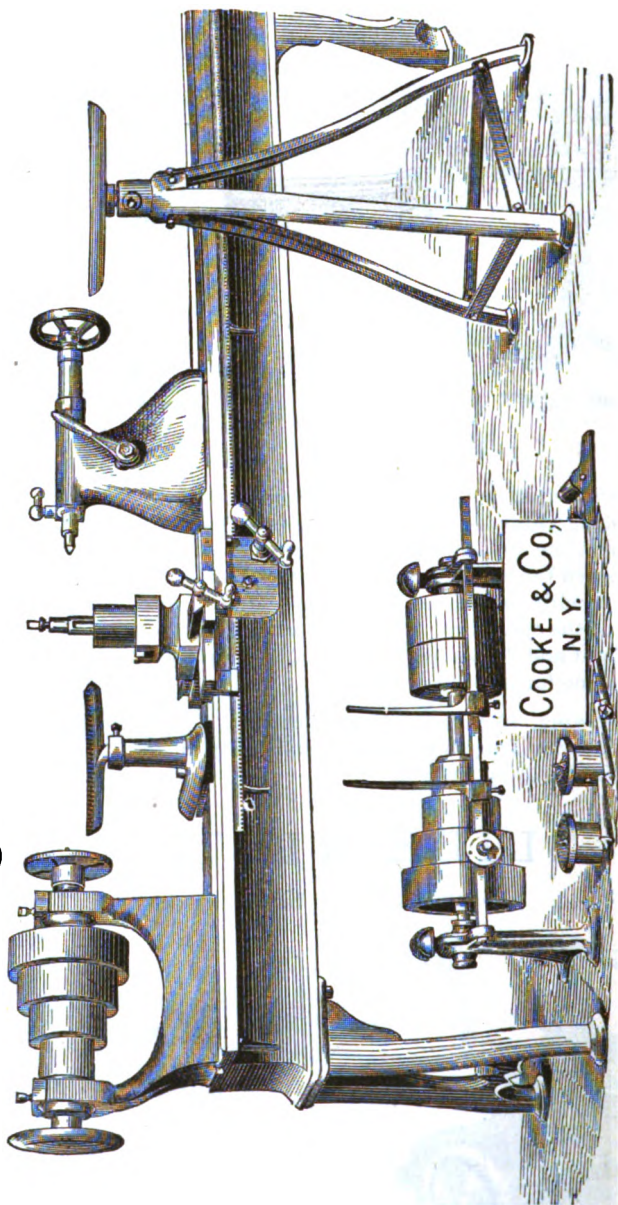


Fig. 1120.

We furnish these Lathes all complete on iron beds, as shown, and can supply any length of bed required.

We also furnish them without beds, if desired, for fitting to wood shears.

They swing 24 inches over the shears, and are complete with over-head counter-shafts, floor rest or stand, two face plates (one for each end of head spindle), rests and T's, two spur centres, two common centres, one female centre, and two chucks with taper screws. Cone pulleys are wood, four changes for 8 inch belt, steel spindles, boxes lined with the best quality of Babbitt Metal.

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FOR PRICES SEE ACCOMPANYING LIST.

FOOT POWER ENGINE LATHE.

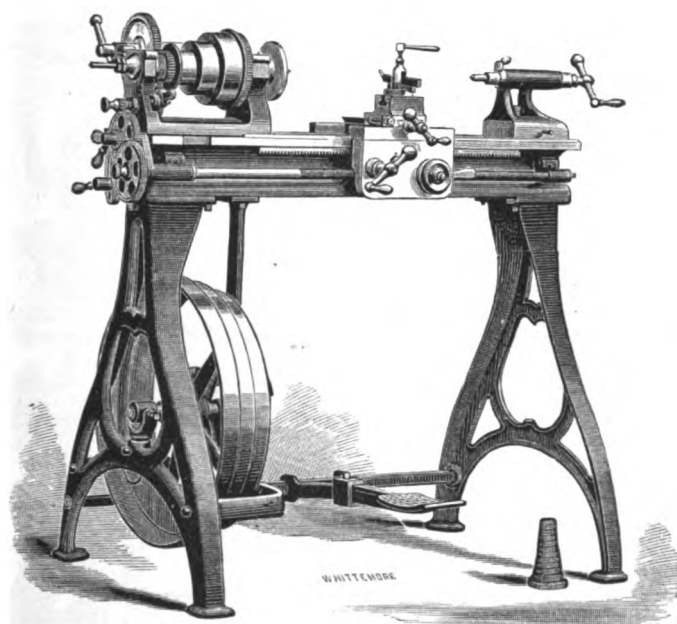


Fig. 1121.

No.	Swing.	Length of Bed.	Distance between Centres.	Hole in Spindle.	Weight.
1,	10 inches.	3½ feet.	24 inches.	1 inch.	350 lbs.
2,	10 "	4 "	32 "	1 "	375 "
3,	11 "	4 "	28 "	1 "	525 "
4,	11 "	5 "	38 "	1 "	550 "

Furnished with Countershaft if desired.

ENGINE LATHE FOR FOOT POWER.

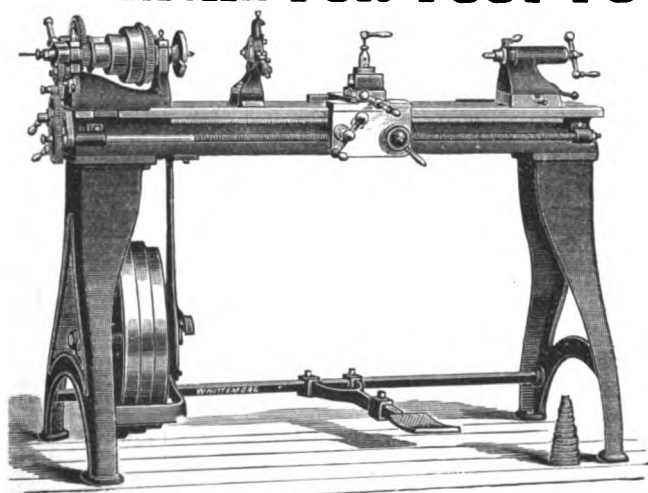


Fig. 1122.

SIZE.—Swing, 12 inches; Length of Bed, 4, 5, or 6 feet.

Furnished with Countershaft if desired.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

6-FOOT ENGINE LATHE.

15-INCH SWING.

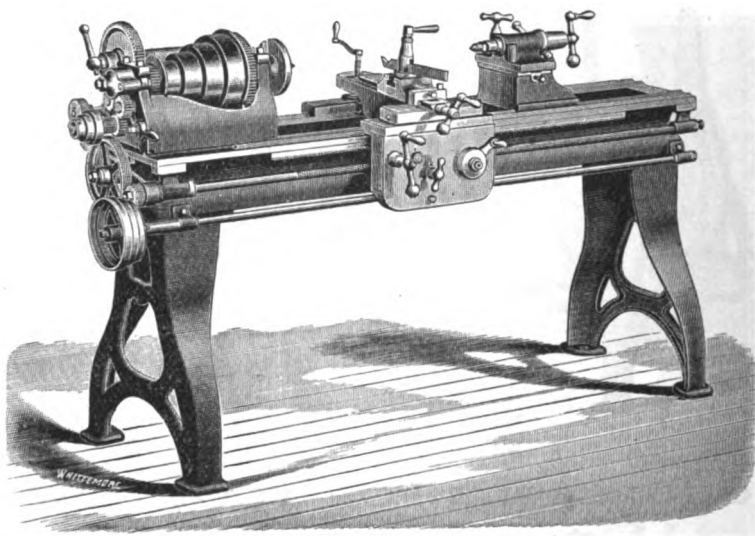


Fig. 1123.

This cut represents our 6-foot, 15-inch swing Engine Lathe, with Lock Gib Rest ; raise and fall Screw ; open and shut nut on Screw ; Friction Feed attached to rod in apron ; Compound Gear, to cut threads from 5 to 36 ; Friction Pulley on Counter Shaft, 10 inches in diameter, 3 inch face ; swings over way 15 inches, swings over carriage 7 inches, distance between centres 3 feet 7 inches.

We make the same Lathe with plain Gib Rest, with ring and circle on tool post to raise or lower point of tool as required. Swings over way 15 inches, swings over carriage 10½ inches.

Weight, 1150 pounds.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

New Haven Machine Tools.

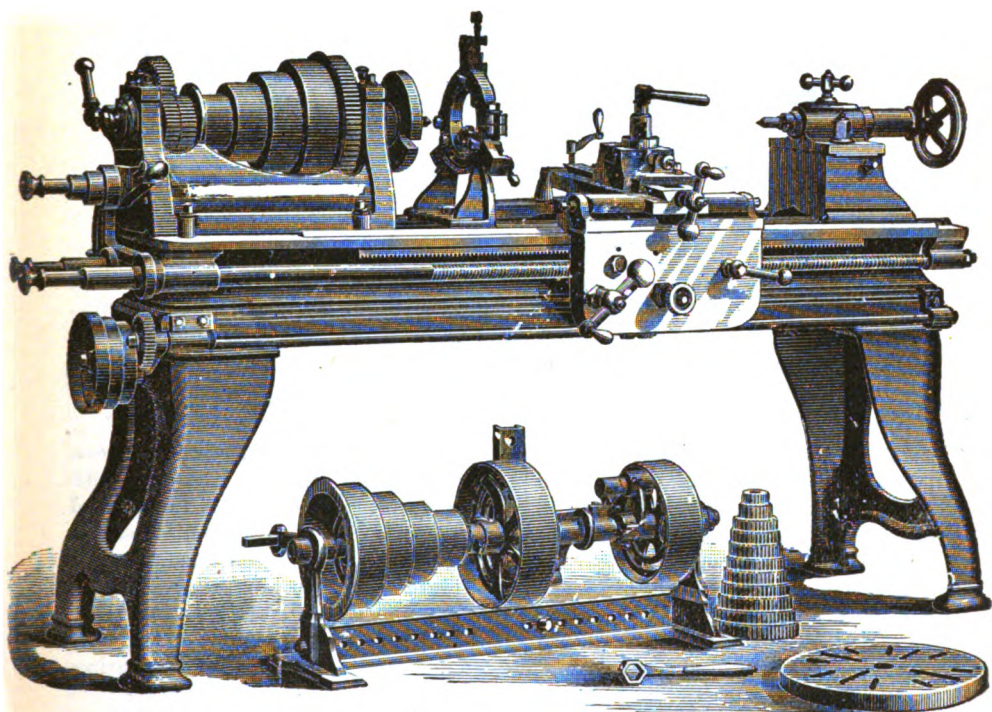


Fig. 1124.

18 Inch Swing Engine Lathe.

With Independent Friction Feed, Gibbed Rest.

No.	Swing over Bed.	Swing over Rest.	Length of Bed.	Between Centres.	Weight, about
8,	18 inches.	9 inches.	6 feet.	3 feet.	1,600 lbs.
8½,	18 "	9 "	8 "	5 "	1,900 "
9,	18 "	9 "	11 "	8 "	2,800 "

We can furnish Lathes of these patterns of any desired lengths to order. No. 9, and all longer beds, have extra sets of legs. They all have steel spindles; front bearings 2½ inches diameter, and 4 inches long; brass boxes; cone pulleys take a 2½ inch belt; strongly back geared. They are furnished with Bean's new patent noiseless counter shafts, also large and small face plates; new and improved centre rest, with large opening in centre; wrenches; full sets of screw-cutting gearing.

These Lathes have our new patented automatic device for preventing the turning screw-cutting feeds from both becoming engaged at the same time, thus preventing liability of accident and breakage.

Driving Pulleys on counter-shaft are 12 inches diameter, and 3 inch face, and speed should be from 110 to 115 per minute. Screw, 5 threads to the inch.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

NEW HAVEN MACHINE TOOLS.

We also furnish Lathes similar in style to that described on preceding page, but of larger and smaller dimensions, complete with all fixtures, as follows :

15 Inch Swing, Engine Lathes.

With Friction Feed, Gibbed Rest.

No.	Length of Bed.	Swing over Bed.	Swing over Rest.	Turn in Length.	Weight, about.
7,	5 feet,	15 inches.	8 inches.	2 ft. 6 in.	1,100 lbs.
6,	6 "	15 "	8 "	3 " 6 "	1,200 "
6½,	7	15 "	8 "	4 " 6 "	1,800 "

Steel spindles, front bearings, 1½ inch in diameter and 8 inches long. Cone pulleys take a 2-inch belt, 4 changes. Bean's patent noiseless counter-shaft; driving pulleys 10 inches in diameter, and 2½ inch face; speed of counter-shaft about 115 per minute.

22 Inch Swing, Screw Cutting Engine Lathes.

These lathes are intended for general use in machine work, and have been designed with the view of producing a plain, heavy tool, that could be used with convenience and economy of time in turning, boring, screw-cutting, facing, and all the various purposes for which such tools are needed. The cone pulleys are of large diameter, and width of face; steel spindles have long and well fitted bearings of proper diameter to insure stiffness; the various feeds for turning, screw-cutting, cross-feed, &c., are easy of access and efficient in operation; the Rest has very long bearings on the A's and is gibbed front and back to the outside of the bed. All these lathes have independent rod and friction feed; the screw-cutting gearing is entirely distinct in all.

No.	Swing over bed.	Swing over Carriage.	Length of bed.	Between Centres.	Weight, about.
1,	22 inch.	14 inch.	8½ feet.	5 feet.	2,800 lbs.
2,	22 "	14 "	11½ "	8 "	3,200 "
3,	22 "	14 "	18½ "	10 "	3,500 "

Steel spindles, front bearing to head spindle, 4½ in. long, 2½ in. diameter. Tail spindle, 1½ in. diameter. Driving pulleys on counter-shaft are 12 inches in diameter, and should run about 70 to 75 revolutions per minute. Cone pulleys take a 3 in. belt.

26 Inch Swing, Engine Lathes.

No.	Swing over Bed.	Swing over Carriage.	Length of Bed.	Between Centres.	Weight, about.
15½,	26 in.	17 in.	10 feet.	6 feet.	3,800 lbs.
16½,	26 "	17 "	12 "	8 "	4,200 "
17½,	26 "	17 "	16 "	12 "	4,800 "

Steel spindles, front bearing to head spindle 5 in. long, 2½ in. diameter. Tail spindle, 2½ in. diameter. Driving pulleys on counter-shaft are 12 and 14 inches in diameter, 3½ inch face, and should run about 110 revolutions per minute. Cone pulleys take a 3½ inch belt.

Chucks of all makes and sizes can be furnished if desired, fitted to the lathes, at reasonable prices.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

New Haven Machine Tools.

30-INCH SWING, ENGINE LATHE.

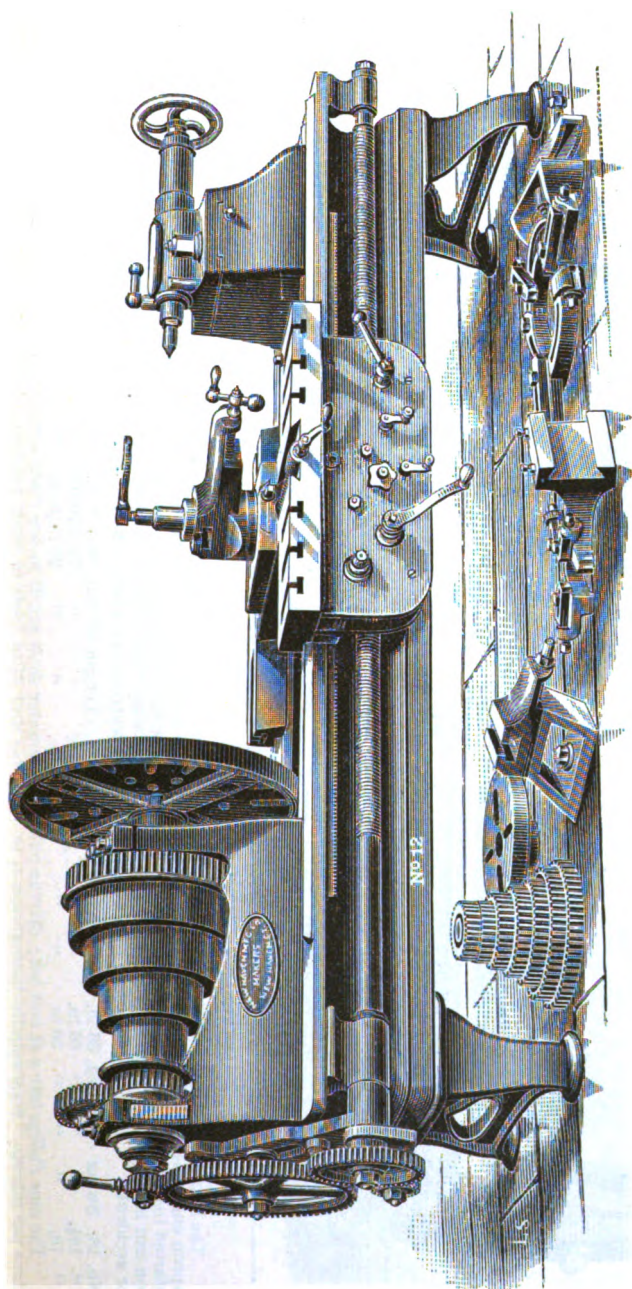


Fig. 1125.

30 inch swing over Bed.

No.	Length of Bed.	Turn in Length.	Weight, about
11	22 ft. 6 in.	18 feet.	8,800
12	12 ft. 6 in.	8 feet.	6,400
13	15 ft. 6 in.	11 feet.	7,900
14	18 ft. 6 in.	14 feet.	8,000

20 inch swing over Carriage.

The above have screw cutting gearing, power cross feed, compound rests, centre and follower rests, large and small face plates, extra tool block for turning full swing of lathe, counter-shaft with tight and loose pulleys, wrenches, etc.

Steel spindles, front bearing 6 inches long, $3\frac{1}{2}$ inch diameter, cone pulleys 4 changes, for 4-inch belt.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

NEW HAVEN MACHINE TOOLS.

36-INCH SWING ENGINE LATHES.

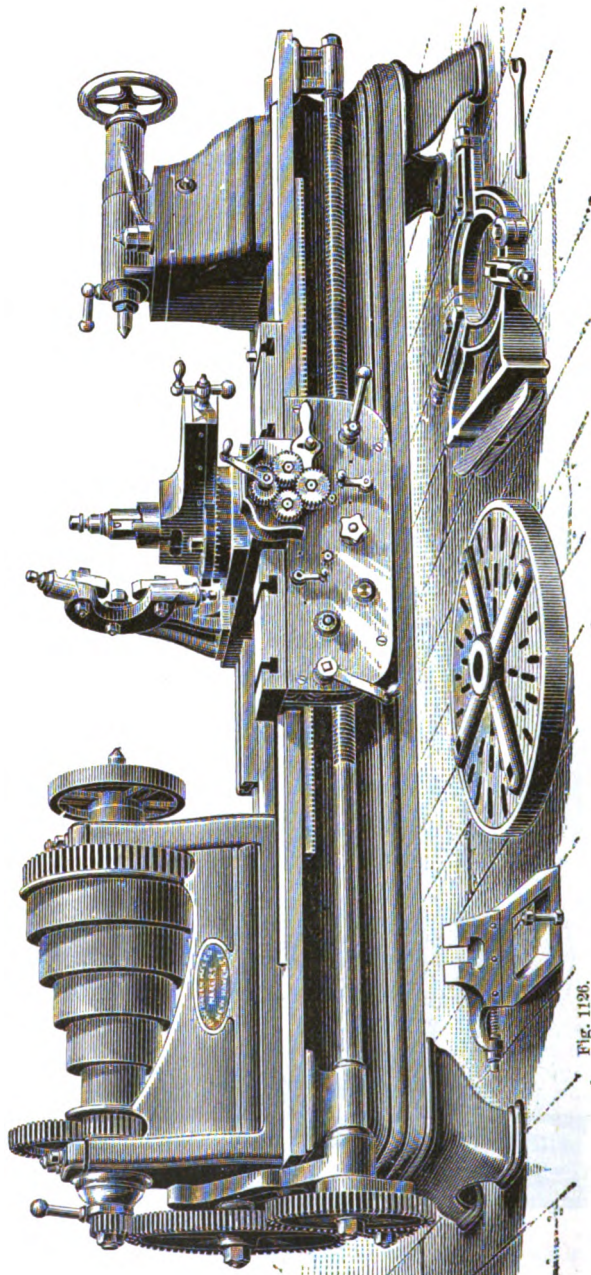


Fig. 1196.

The lateral and cross feeds are independent of the screw-cutting motion, being communicated through trains of gearing inside the apron engaging the rack pinion, and readily changeable for backward or forward motion by handles in front of apron, and stopped or started instantly by friction knob, the thread of the leading screw being used *only* for screw-cutting. When cutting screws, the rack pinion can be withdrawn from the rack, thus preventing the liability of accident by the turning feed becoming engaged through carelessness or accident.

DIMENSIONS AS FOLLOWS:

No. 18.	Swing over Bed,	36 in.	Swing over Carriage,	25 in.	Length of Bed,	19 ft. 6 in.	Bed Centres,	14 ft.	Weight, about	11,000 lbs.
" 18A,	" "	36 in.	" "	25 in.	" "	19 ft. 6 in.	" "	8 ft.	" 9,200 "	
" 19,	" "	36 in.	" "	25 in.	" "	23 ft. 6 in.	" "	20 ft.	" 12,600 "	

The *cones Pulleys take a 4 1/2 inch belt*; driving pulleys on counter shaft are 23 inches diameter, 4 in. face, and should run about 80 revolutions per minute. Steel spindle journals are 4 1/2 in. diameter and 64 in. long in front bearings, and 3 in. diameter and 4 1/2 in. long in back bearings. The thread on the leading screw is cut 3 to the inch. We can furnish the above Lathes with Heads raised to swing 42 inches over the bed, if desired.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

NEW HAVEN 50-INCH SWING ENGINE LATHE.

COOKE & CO.

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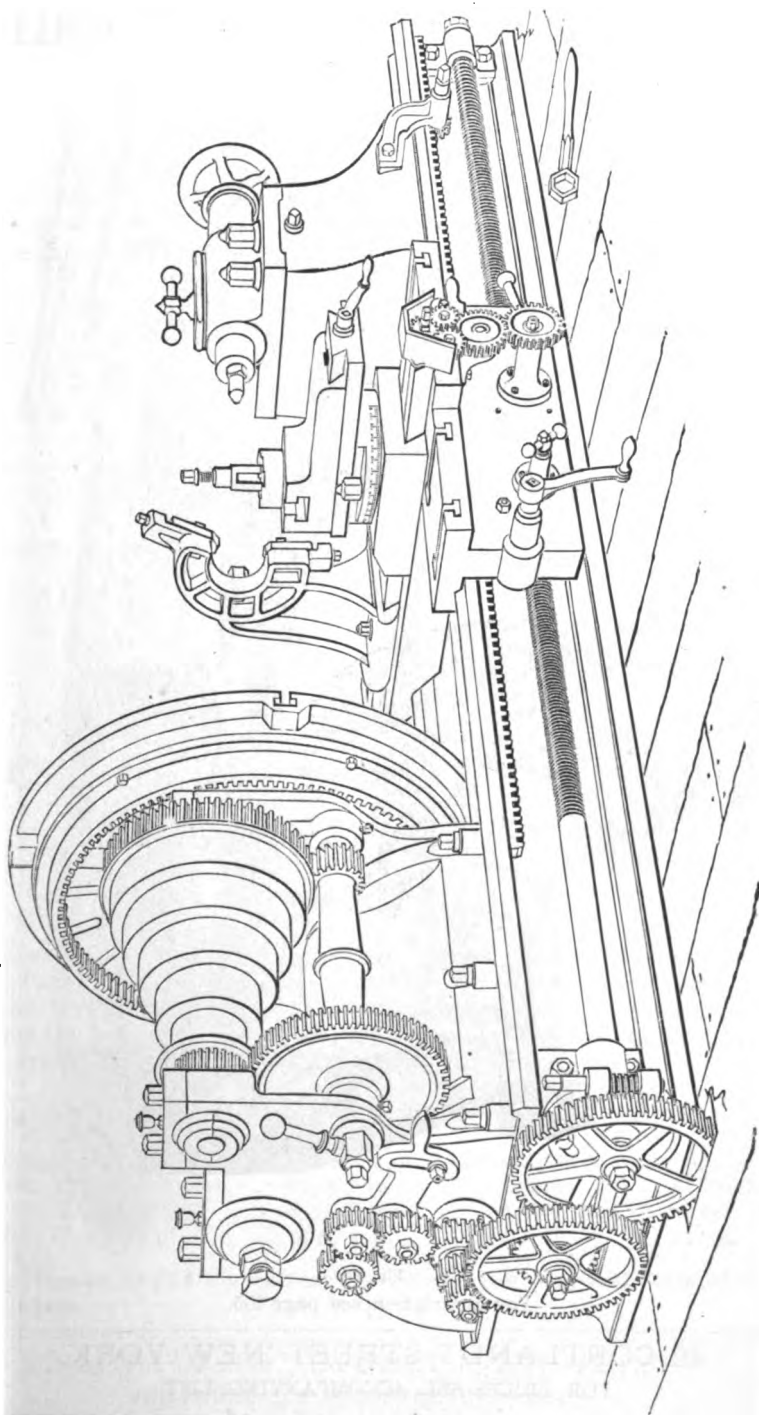


Fig. 1197.
For description see page 355.

New Haven 60-inch Pulley Lathe.

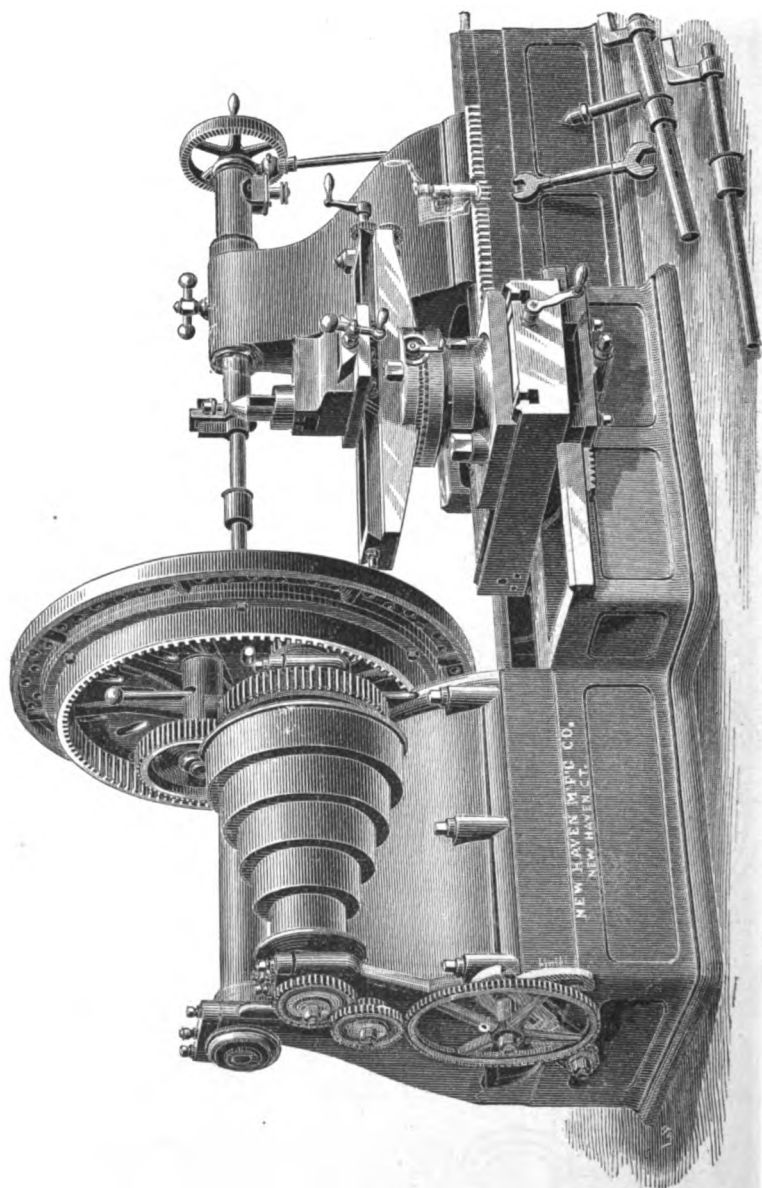


Fig. 1128.

For description see page 855.

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FOR PRICES SEE ACCOMPANYING LIST.

DESCRIPTION OF 50-INCH SWING ENGINE LATHE.

FIG. 1127.

Complete with screw-cutting gearing, power cross-feed, compound rest, centre and follow rests, extra tool block for turning work the full swing over the bed, over-head counter-shaft, with tight and loose pulleys and hangers and wrenches. The face plate is keyed to the spindle and is driven by pinion on the end of cone pulley spindle, gearing into an internal *cut gear* on the face plate. The compound rest is heavy and strong, and made to *feed at any angle by power*, independently of the usual cross-feed of the carriage, and is very useful for *taper boring*, &c. The turning and cross-feeds are independent, &c. Cone pulleys take a 4-inch belt. Driving Pulleys on counter-shaft are 22 inches diameter and should run about 240 per minute. Leading screw 2 threads to the inch.

The spindles are all steel; the front bearing to face plate spindle is 6 inches diameter and 7 inches long; back bearing 5 inches diameter and 5 inches long.

Dimensions are as follows :

No.	Swing over Bed.	Swing over Rest.	Length of Bed.	Between Centres.	Weight, about
20	50 inch.	34 inches.	20 ft. 6 in.	18 ft. 6 in.	17,000 lbs.
21	50 "	34 "	14 ft. 6 in.	7 ft. 6 in.	15,000 "
22	50 "	34 "	24 ft. 6 in.	17 ft. 6 in.	19,000 "

DESCRIPTION OF 60-INCH SWING ENGINE LATHE.

FIG. 1128.

Similar in design to above described, but with larger Heads and more powerfully geared. The spindles are all steel except the face plate spindle, which is cast iron, and extends through the back end of the Head, so that a large face plate can be attached to the back end of the spindle if desired. The front and back bearings to the main spindle are each 8 inches diameter and 8 inches long.

Dimensions are as follows :

Swing over Bed.	Swing over Rest.	Length of Bed.	Between Centres.	Weight, about
60 inch.	44 inches.	14 ft. 6 in.	7 feet.	17,000 lbs.
60 "	44 "	20 ft. 6 in.	18 "	19,000 "
60 "	44 "	24 ft. 6 in.	17 "	21,000 "

We can furnish any of the Lathes described on this page with beds of any desired lengths.

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New Haven Horizontal Boring Lathe.

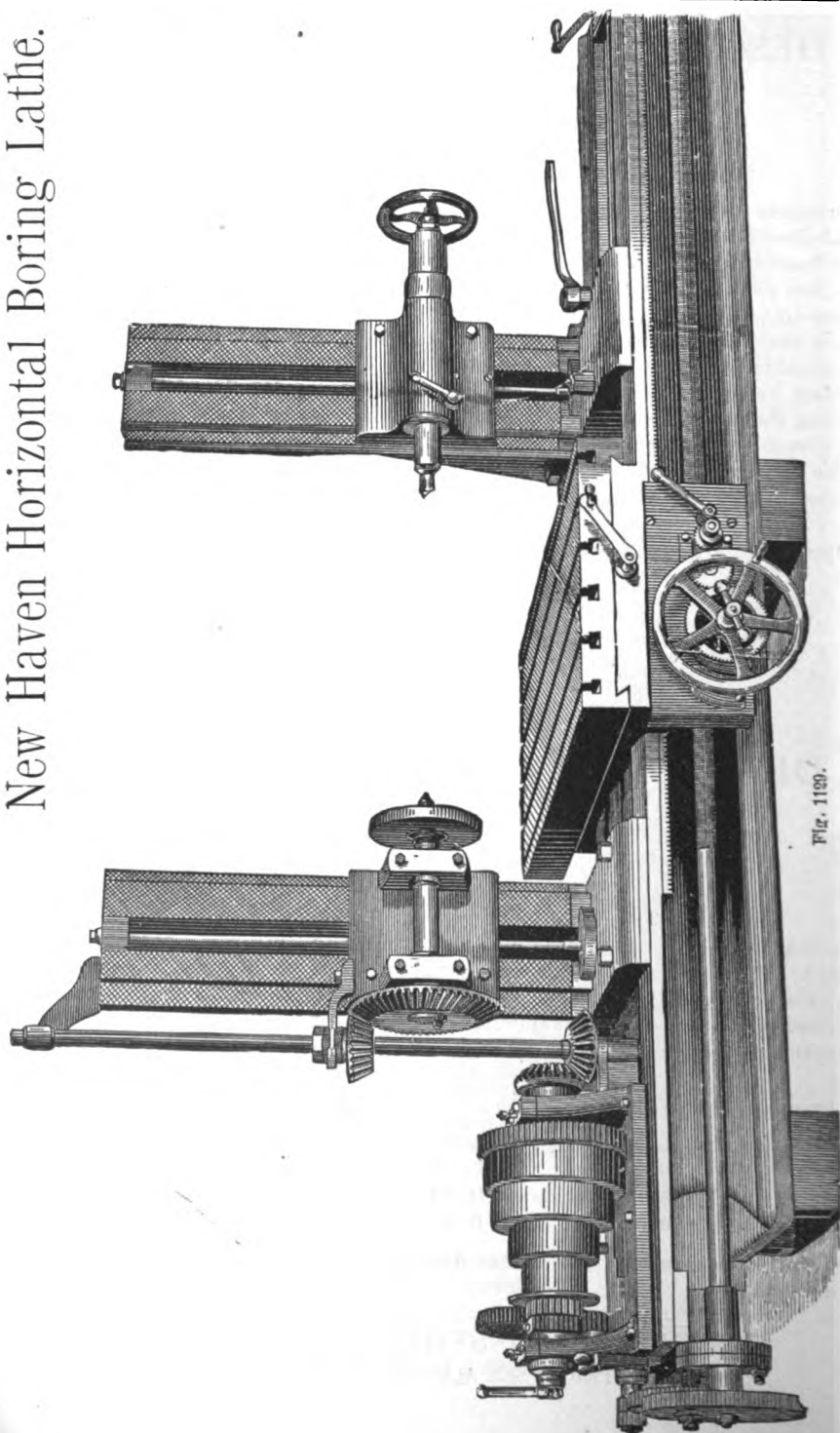


Fig. 1129.

DESCRIPTION OF HORIZONTAL BORING LATHE.

FIG. 1129.

The heads are raised and lowered simultaneously by means of bevel gearing and splined rod operated from the end of the bed; the tail stock head can also be set at any position on the bed. The carriage feeds laterally by means of the screw.

The spindles and racks are steel, and the bearings are lined with the best quality of Babbitt Metal.

This Lathe is complete with counter-shaft pulleys and hangers, wrenches, &c., and can be arranged to cut threads, if desired.

DIMENSIONS AS FOLLOWS :

Greatest swing over ways, 8 feet.

Boring table, 5 feet long and 30 inches wide.

Length of bed, $14\frac{1}{2}$ feet.

Weight, about 10,500 lbs.

Centres lift above the table, 41 inches.

Traverse of table across, 20 inches.

Distance between centres, 7 feet.

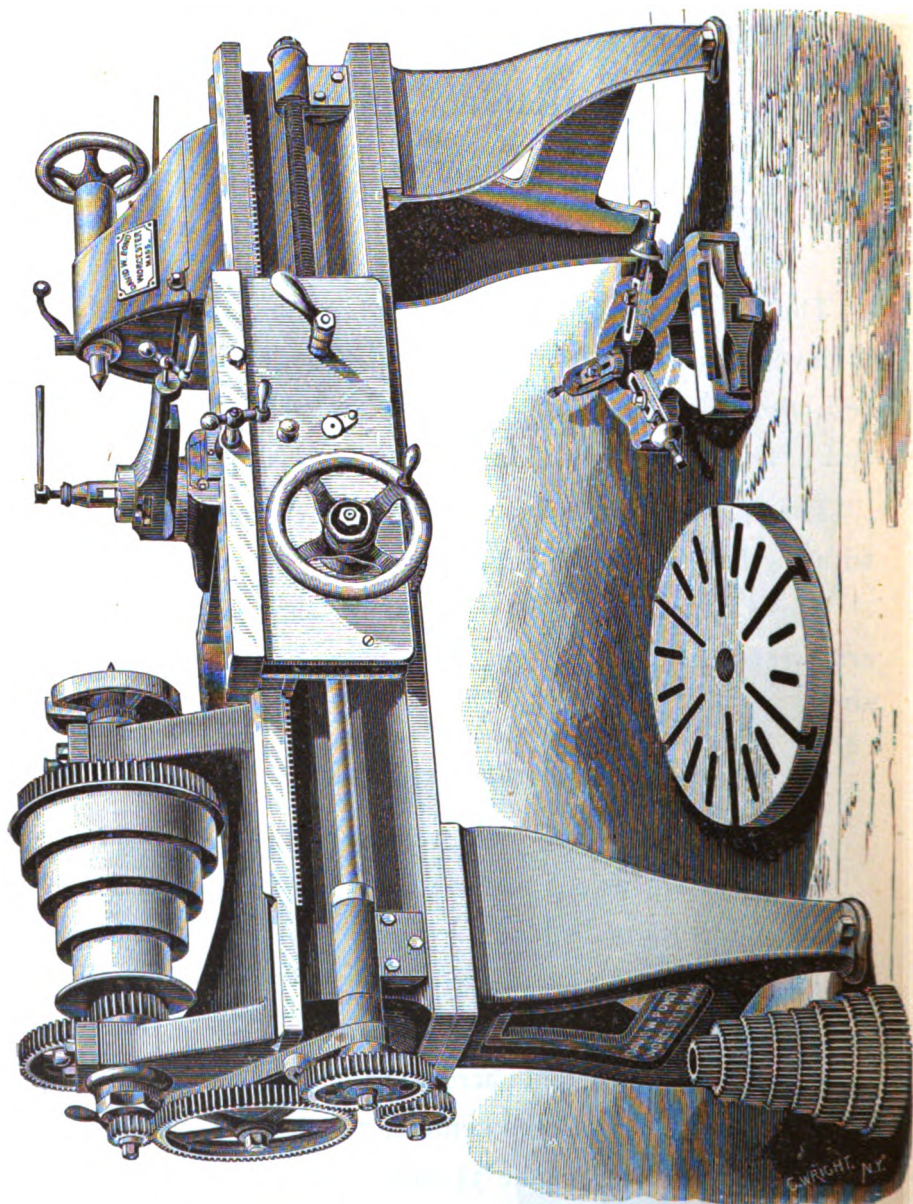
Cone pulleys take $3\frac{1}{2}$ inch belt.

Beds of different lengths can be furnished.

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ENGINE LATHE—19 INCHES SWING.



BACK GEARED, SCREW CUTTING, FRICTION FEED, POWER CROSS FEED.

Swing over Bed.	Swing over Rest.	Length of Bed.	Turn in Length.	Weight.	Weight per foot.
19 inches.	12½ inches.	6 feet.	2 ft. 6 inches.	2,325 lbs.	125 lbs.

BEDS CAN BE MADE OF ANY DESIRED LENGTH. COMPOUND RESTS can be furnished with this Lathe, if ordered. Fitted with plain or rise and fall rest. For description see page 361. &c.

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ENGINE LATHES 22 -AND -26 INCHES SWING.

COOKE & CO.

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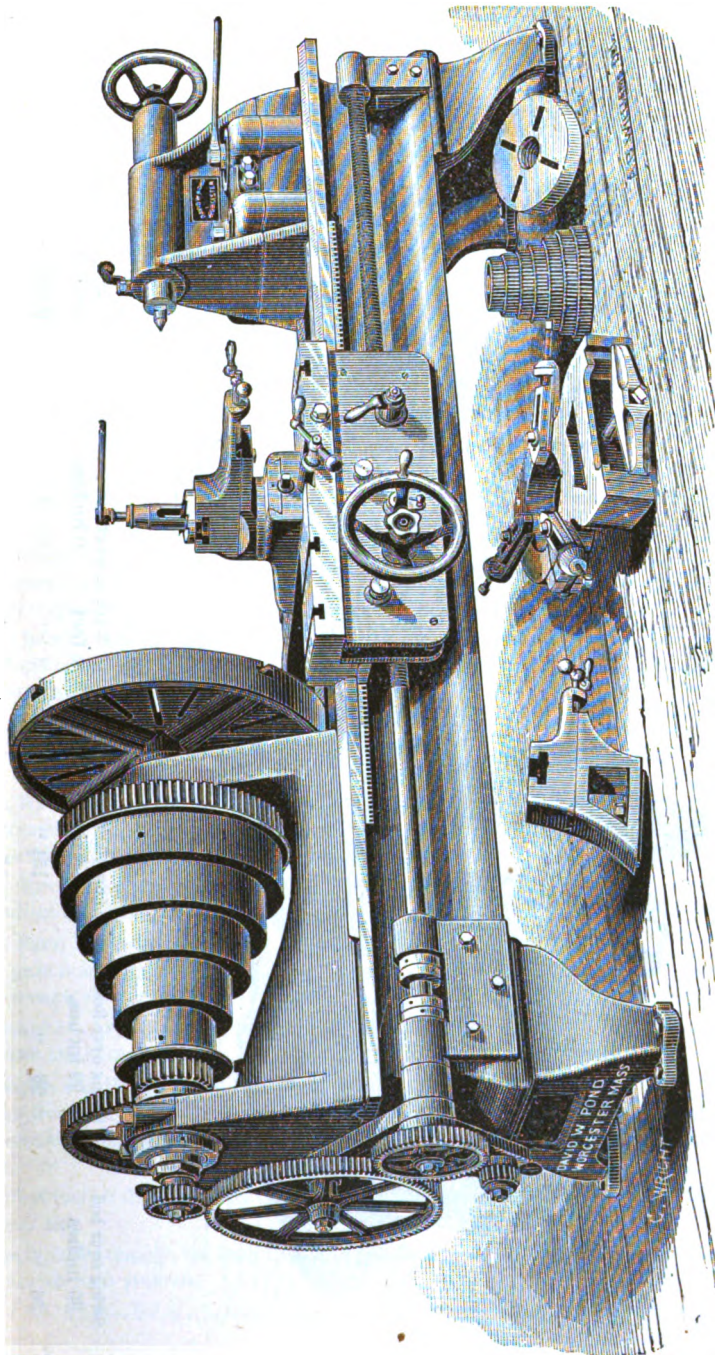
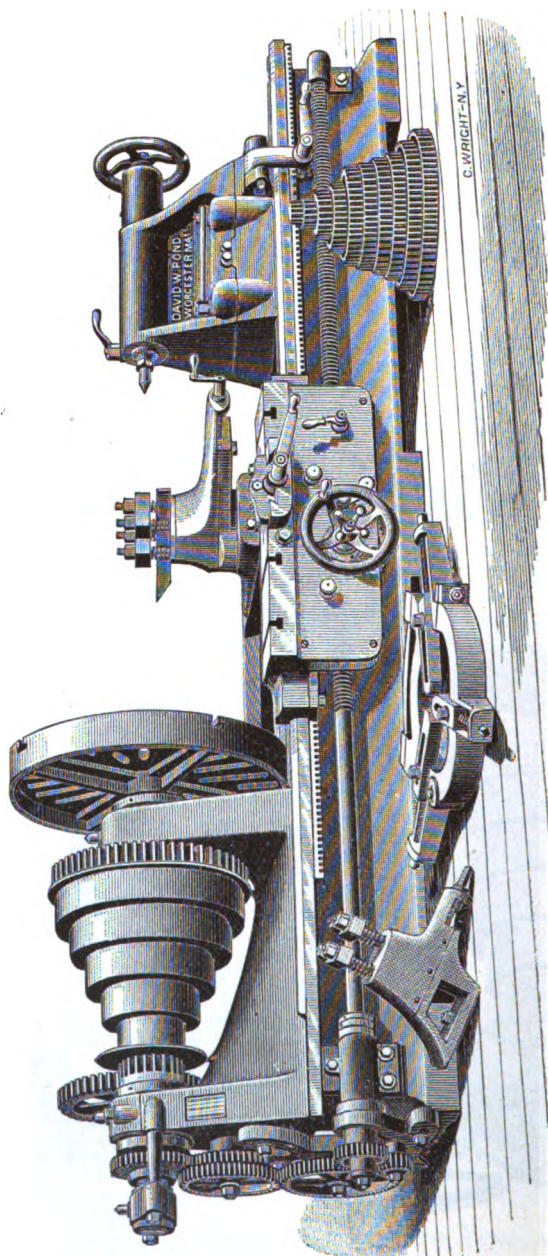


Fig. 1131.

Swing over bed.	Swing over Bed.	Length of bed.	Turn in length.	Weight.	Weight per foot.
21½ inches.	16½ inches.	8½ feet.	4½ feet.	8,400 lbs.	175 lbs.
26 "	18½ "	8 "	8½ "	4,200 "	280 "

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FOR PRICES, SEE ACCOMPANYING LIST.

Engine Lathes—30, 36 and 40 Inches Swing.



Figs. 1132.

Swing over bed. 30 inches.	Swing over Rest. 22 inches.	Length of bed. 8 feet.	Sizes.		Turn in length. 2 feet	Weight. 5,800 lbs.	Weight per foot. 275 lbs.
36 "	26 "	15½ "	8 "	8 "	8 "	9,000 "	385 "
40 "	28 "	15 "	7 "	4 "	4 "	13,750 "	435 "

For description see page 361.

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FOR PRICES SEE ACCOMPANYING LIST.

General Description of Engine Lathes, 19, 22, 26, 30, 36 and 40 Inches Swing.

NEW DESIGN.

These Lathes are simple in design, very heavy and convenient, have back gears screw cutting apparatus, *compound rests*, *power cross feeds*, extra tool blocks for pulleys or other work as long as Lathes will swing (except 19 in. swing), large and small face plates, centre rests, complete counter shafts, wrenches, &c.

All moving parts have *unusually long bearings*, viz: the rests or carriages on the beds, also the tail blocks, the cross shoes on rests, the tool shoes on swivels, the top of the tail blocks on bases in setting to turn tapers, the length of tail spindles, also head spindles and their journals. The DIAMETERS of the cones, gears, journal bearings and tail spindles are unusually large.

FEED MOTIONS are positive and very simple, tool can be made to travel forward and backward the length of the bed or across the rest by a single movement of handles on the Rest, hence, *always within the reach of the workman* when watching the cut. The cross feeds have sufficient traverse to "square off" *entire swing* of lathes with setting the tool but once.

TAIL BLOCKS fastened to bed by movement of one bolt only and travel nearly the entire width of the bed in setting over for taper, without the usual necessity of taking out one bolt, and are operated by a single screw from the front side.

THE FEED GEARING is connected to rack on the beds, and driven from a slot in the screws, arranged not to impair the accuracy of the threads for screw cutting, and is without worm or screw.

THE RACK PINIONS are so arranged that *they can be drawn entirely out of the rack*, absolutely preventing the friction feeds from becoming engaged while cutting screws and thereby causing breakage; also avoids wear of gearing and shafts in aprons when screw cutting.

THE RESTS are gibbed to the *outside of the beds, both front and back*, by a new device that permits adjustment, without use of springs or additional pieces.

THE FEED MOTIONS are applied by a simple and positive friction. *No studs are used*, every wheel or gear is mounted on a shaft having *bearing on each end*. All small gears and shafts are made of *wrought iron or steel*, and all parts subjected to bruising wear are case hardened.

A SHAFTING ATTACHMENT can be used on these Lathes when they are *especially* intended for TURNING SHAFTING.

It consists of a HEAVY ARCH PIECE bolted on the Rest, carrying THREE TURNING TOOLS, two on the front and one on the back of shaft, and having a hole bored out in the upper part of Arch to receive bushes for steadying the Shaft while turning, or to hold fluted rings for finishing the Shaft.

The first tool on the front takes off the first chip, and the tool on the back turns the Shaft to its proper size.

After it passes through the bush the water polishing tool finishes the Shaft, leaving it PERFECTLY ROUND AND SMOOTH.

Each tool is adjusted by a separate screw operating the tool block that carries it.

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FOR PRICES SEE ACCOMPANYING LIST

ENGINE LATHE, 60 Inches Swing. NEW DESIGN.

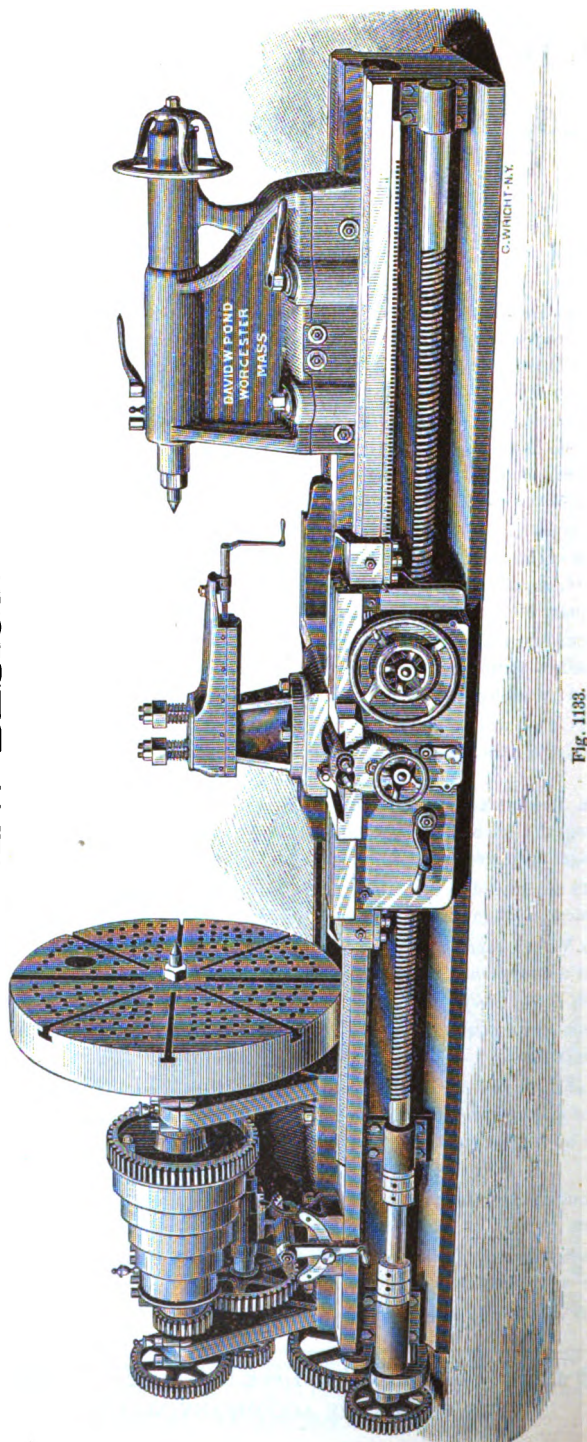


Fig. 1133.

Beds can be made of any desired length.

For description see page 363.

ENGINE LATHE, 60 INCHES SWING.

NEW DESIGN.

This Lathe is *very* heavy, but the design is such that it can be operated as conveniently and quickly as smaller lathes, the feeding device being same, with the exception that gears, &c., are made strong enough for largest work that can be done with Lathe, and that provision is made for power feed at an angle.

FEED MOTION is positive and very simple, tool can be made to travel forward and backward the length of the bed, or across the rest by a single movement of handles on the rest, hence, *always within reach of the workman* when watching the cut.

THE CROSS FEED has sufficient traverse to "square off" *entire swing* of lathe with setting the tool but once.

THE FEED GEARING is connected to rack on the bed, and is driven from a slot in the screw arranged *not to use the thread, consequently its accuracy is not impaired for screw cutting*, and is without worm or screw.

THE RACK PINION on these lathes is so arranged that *it can be drawn entirely out of the rack*, absolutely preventing the friction feed from becoming engaged while cutting screws and thereby causing breakage; also, avoids wear of gearing and shafts in apron when screw cutting.

THE FEED MOTION is applied by a *simple and positive friction*. *No studs are used. Every wheel or gear is mounted on a shaft having a bearing at each end.* All small gears and shafts are made of wrought iron or steel, and all parts subject to bruising wear are case hardened.

Range of threads that can be cut is from 16 threads in one inch to 1 thread in six inches.

ALL MOVING PARTS have *unusually long bearings*, viz.: the rest or carriage on the bed, also the tail block, the cross shoe on rest, the tool shoe on swivel, the top of tail block on its base in setting to turn tapers, the length of tail spindle, also head spindle and its journals. The DIAMETERS of the cone, gears, journal bearings and tail spindle are unusually large.

THE REST is gibbed to the *outside of the bed both front and back* by a new device that permits adjustment without use of springs or additional pieces, and by the turning of two bolts it can be locked to bed to prevent backing off when facing work.

THE HEAD is arranged with a five section cone having gears calculated to give fifteen changes of speed, the slowest being correct for the full swing of the lathe, and the fastest for work as small as three inches diam., the change between any two speeds being the same. This cone is mounted on a shaft with pinion on same playing into an internal gear on the face plate. To connect different gears to produce desired speed, a device easily worked by hand lever is used.

THE TAIL BLOCK is secured by four large bolts, can be set over for taper by means of one screw at front of lathe and locked in position in addition to holding bolts.* It has two shafts, one at the back and the other at the front end of lower side; these are so arranged that the whole can be lifted off the bed, bringing the weight on to four rolls, thus making it possible to move so great a weight conveniently.

Countershaft, small wrenches, &c., are furnished.

BEDS CAN BE MADE OF ANY DESIRED LENGTH.

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FOR PRICES SEE ACCOMPANYING LIST.

PEERLESS DRILL, No. 1.

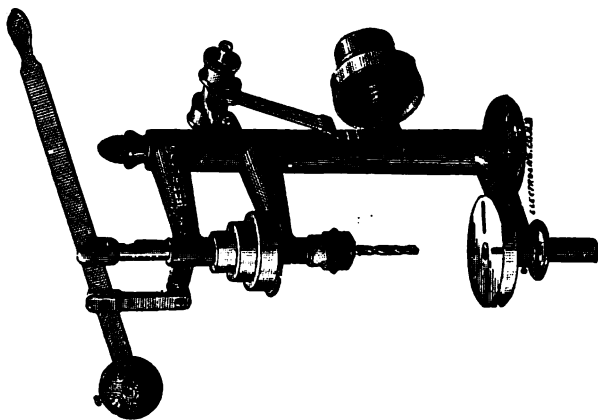


Fig. 1134.

Swings 13 inches; 3 speeds; tight and loose pulleys, $8\frac{1}{4} \times 1\frac{1}{4}$; lever feed; 6-inch iron table—can be raised and lowered. It can be set on bench anywhere in the shop, and operated by belt direct from main shaft. Weight, 45 lbs.; height, 3 feet.

PEERLESS DRILL, No. 1 $\frac{1}{2}$.

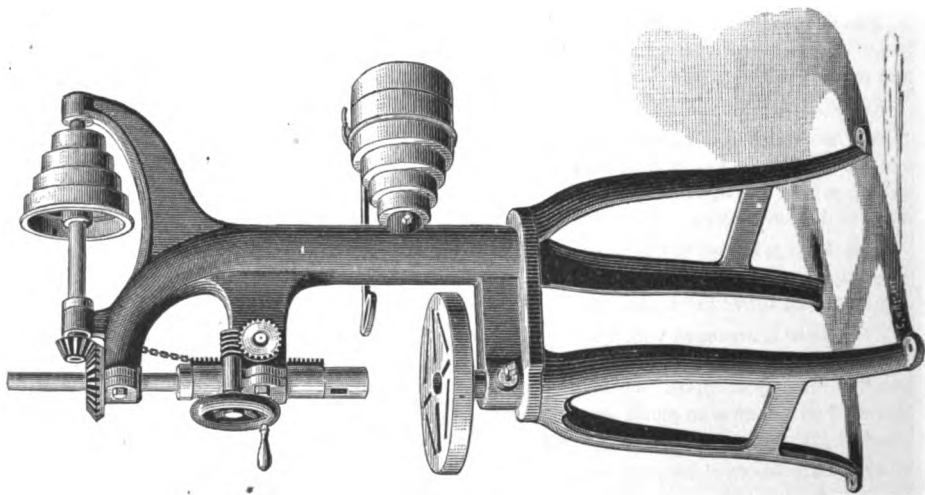


Fig. 1135.

Swings $15\frac{1}{4}$ inches; 4 speeds; tight and loose pulleys, $7 \times 1\frac{1}{4}$; wheel feed; cut bevel gears; 12-inch iron table—can be raised and lowered; spindle 26 inches long, balanced by weight in column, with taper hole for Morse sockets; steel rack; weight, 225 lbs.; height, 5 feet.

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PEERLESS DRILL, No. 3.

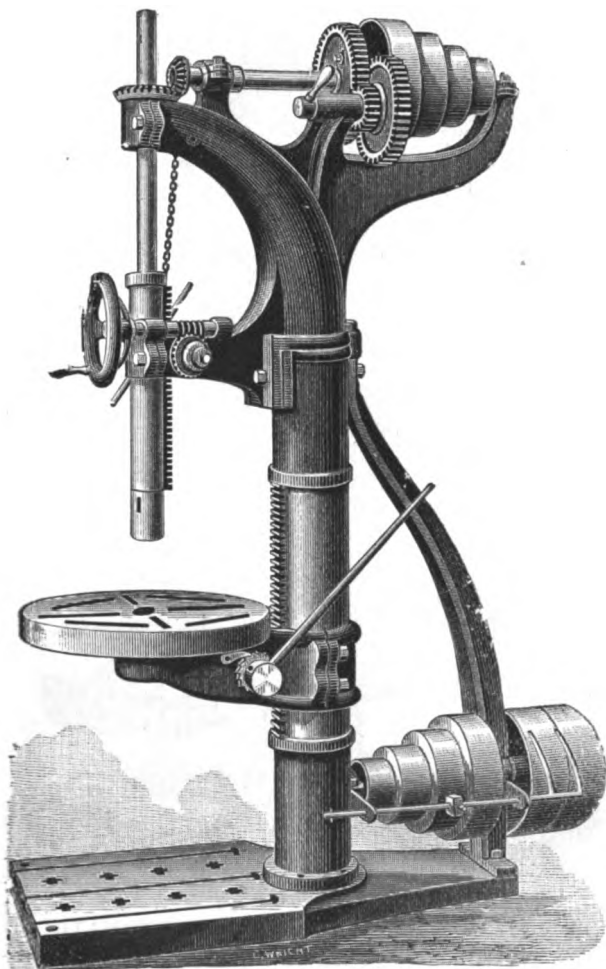


Fig. 1136.

Swings 21 inches; back geared; quick return motion; large steel spindle, 47 inches long, balanced by weight in post; revolving arm and table; the base is also a drilling table; from base to end of spindle, 43 inches; from table to spindle, $20\frac{1}{2}$ inches; pulleys, $10 \times 2\frac{1}{2}$. A strong brace extends from base to column, stiffening it at point of greatest strain—a new feature. Weight, 1,100 pounds; height, 6 feet.

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PRENTICE DRILLS.

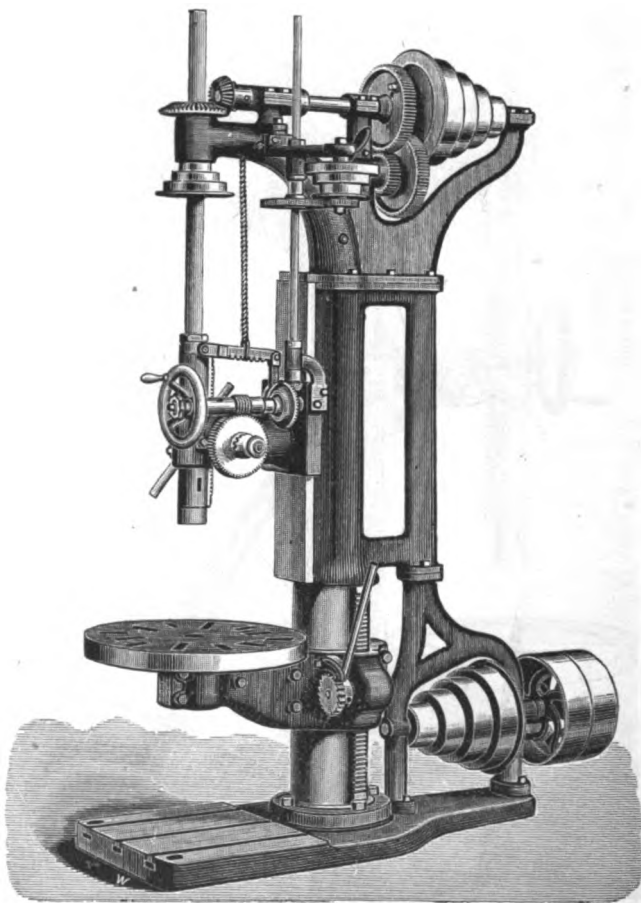


Fig. 1137.

WITH OR WITHOUT BACK GEARS AND AUTOMATIC FEED.

SIZES.

Swing.	Diam. of Table.	Diam. of Spindle	Greatest Distance from Base to Spindle.	Size of Pulley.	Weight.
16 inch.	15 inch.	1 $\frac{3}{8}$ inch.	36 inch.	10x2 $\frac{1}{2}$ inch.	600 lbs.
20 "	18 "	1 $\frac{5}{8}$ "	43 "	10x3 "	700 "
22 "	20 "	1 $\frac{7}{8}$ "	50 "	12x3 "	1100 "
26 "	—	1 $\frac{7}{8}$ "	54 "	12x3 $\frac{1}{2}$ "	1800 "
30 "	—	1 $\frac{7}{8}$ "	58 "	14x4 "	2800 "

The 16 and 20-inch have Stationary Head.

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FOR PRICES SEE ACCOMPANYING LIST.

26-INCH, BACK GEARED DRILLS.

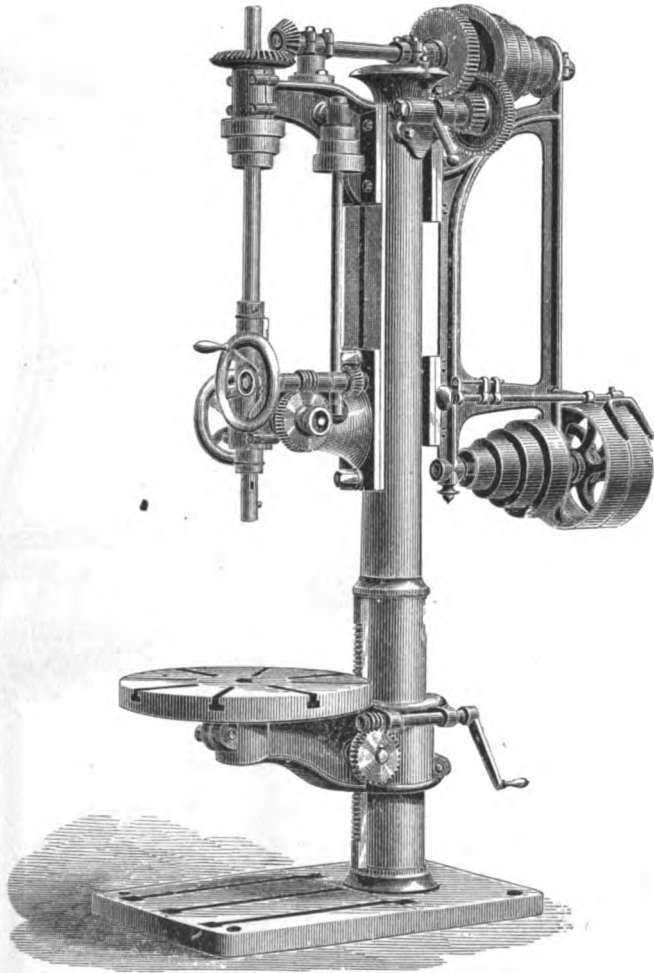


Fig. 1188.

This cut represents the No. 1 $\frac{1}{4}$ Drill, having self-acting down feed, quick return, back gears, large steel spindles, balanced, cut gears and racks, adjustable drilling head, balanced, wrought iron rack and pinion and slotted base plate.

DIMENSIONS :—Height 7 $\frac{1}{2}$ ft., down feed of spindle 7 $\frac{1}{2}$ in., traverse of table 20 in., cone pulleys 2 $\frac{1}{2}$ in. face. Driving pulleys 8 $\frac{1}{2}$ x 13 inches. Weight, 1,900 lbs.

No. 1 is same as No. 1 $\frac{1}{4}$ but without power feed. No. 6 is same as No. 1 $\frac{1}{4}$, but without power feed or back gears and has cone pulleys 3 in. face.

No. 5 (88 inches swing) back geared drill. Fig 1189 is same in general design as the above, but has a patented device for throwing the back gear in and out.

DIMENSIONS :—Traverse of table 18 in., depth of feed 12 in., height 9 feet, cone pulleys 3 in. face. Driving pulleys 16 in. x 3 in. Weight 3,600 lbs.

See cut on page 368.

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FOR PRICES SEE ACCOMPANYING LIST.

38-INCH SWING BACK GEARED DRILLS.

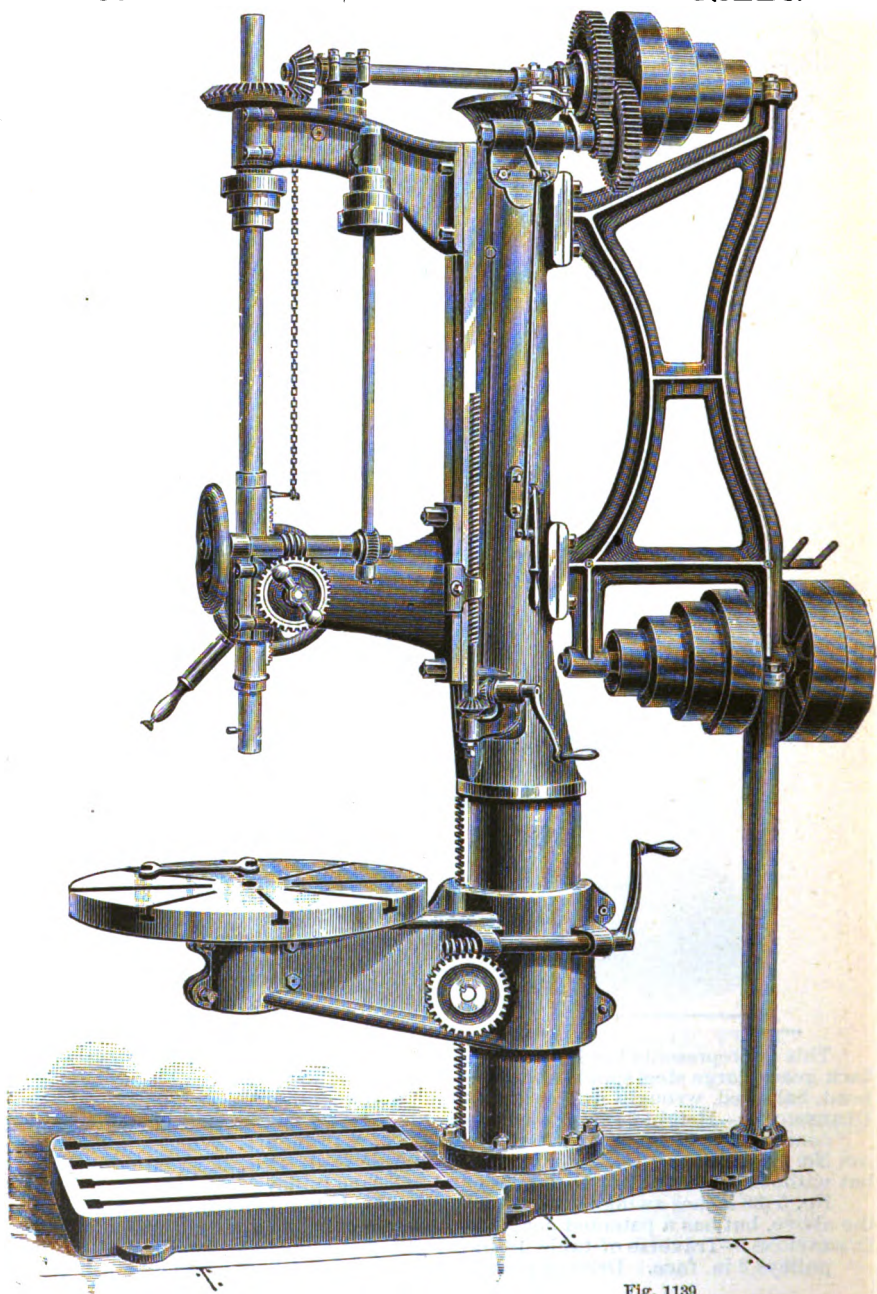


Fig. 1139.

For description see page 367.

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FOR PRICES SEE ACCOMPANYING LIST.

UPRIGHT DRILLS, 22, 25 AND 32 INCHES SWING.

For description see page 370.

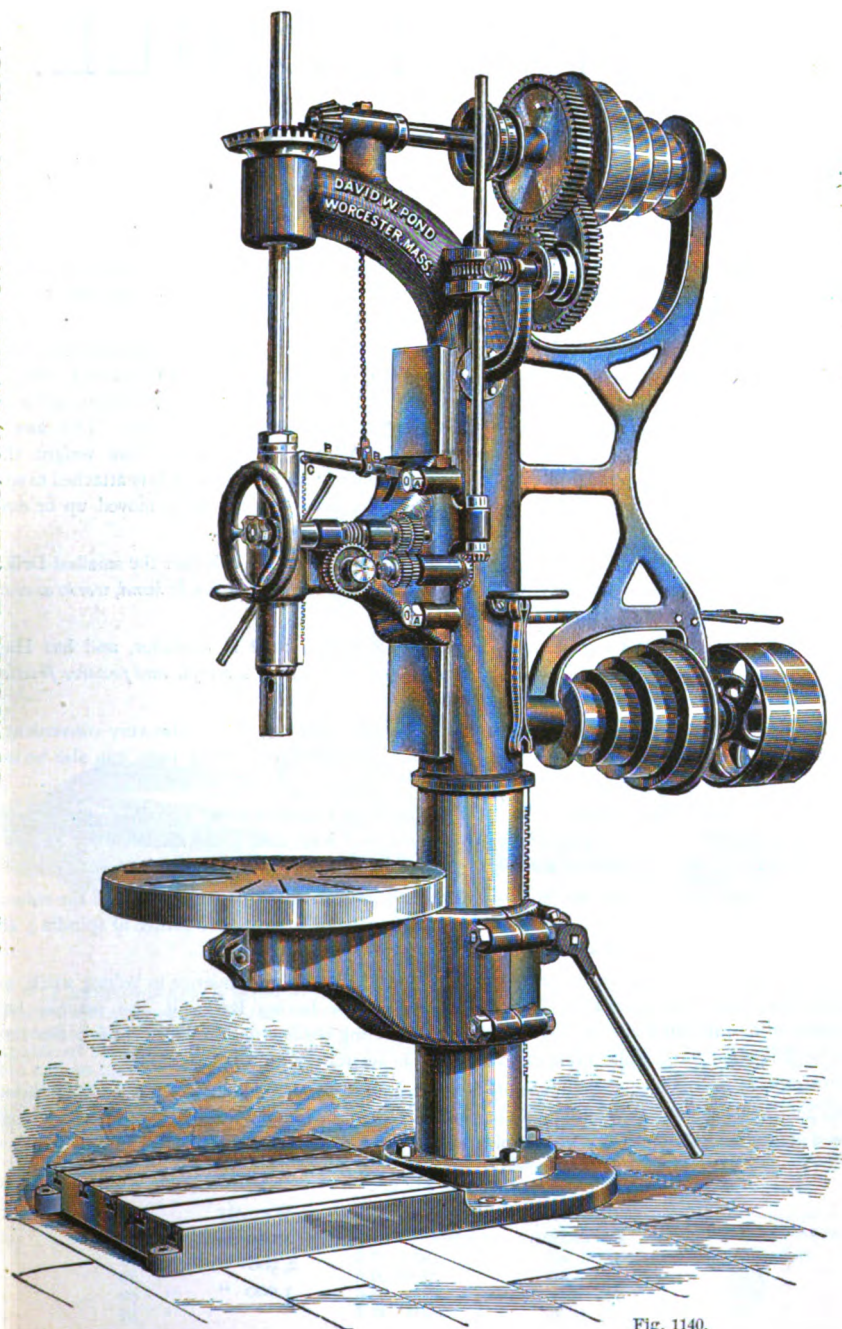


Fig. 1140.

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UPRIGHT DRILL.

NEW DESIGN.

This drill is made from entirely new designs, *placing the metal to give the greatest resistance to breaking strains*, and is well proportioned, with great strength and accuracy of working parts, all of which have large wearing surfaces; *also, has all of the latest attachments for convenience in use.*

The Drill has a PATENTED DEVICE, WHEREBY THE ENTIRE ADJUSTABLE HEAD, INCLUDING THE SPINDLE, IS BALANCED BY ONE AND THE SAME WEIGHT THAT BALANCES THE SPINDLE ALONE, THEREBY DISPENSING WITH RACK, PINION, RATCHET, PAWL AND WRENCH, *otherwise necessary to move the Adjustable Drilling Head, up or down the face of column.* This head is held securely in position by tightening the two nuts, "A" "A," (see cut). The weight then acts on the spindle in the usual manner through the lever, "B" "B," which is attached to spindle, at "C." When nuts "A" "A" are loose, the head can be easily moved up or down by hand.

This device also admits of keeping the spindle evenly balanced, whether the smallest Drill or heaviest Boring Bar, or other tool is used, hence the *Quick Return motion by hand, works as easily with a very heavy tool as with a light one.*

THE DRILL SPINDLE is made from hammered cast steel, large in diameter, and has Hand and four changes of Power Feed, the latter being connected to it by a *simple and positive friction, operating quickly, and is within easy reach.*

The Spindle is also provided with a QUICK RETURN MOTION, that is also very convenient as a hand feed for drilling small holes, and for quick adjustment of cutting tools, can also be used for slotting and splining.

This motion is disconnected from the other feeds by means of a *self operating clutch, which obviates the necessity of dropping the worm out of worm gear, and hence the necessity of getting the thread of worm and teeth of worm gear opposite, when necessary to connect them.*

THE CIRCULAR TABLE can be revolved around its own axis, and swings around the column, thus allowing the placing of any point on the surface of table under centre of spindle; also can be raised or lowered to any position in its traverse on the column.

THE BASE TABLE is accurately planed, having T slots for convenience in bolting work, and is so made that bushings may be fitted, sustaining end of Boring Bars; it also reaches back under column its full width, giving very large supporting surface on the floor. Work too large to be drilled on the circular table can be drilled as accurately on this base table.

The Cones and Gears are unusually large and powerful. Suitable wrenches are furnished. No over-head counter required. Tight and loose Driving Pulleys are each 14 inches diameter by 4 inches face, should make 210 revolutions per minute.

SIZES.

SWING.	WEIGHT.
22 inches.	2,000 lbs.
25 "	2,500 "
32 "	3,000 "

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RADIAL DRILL.

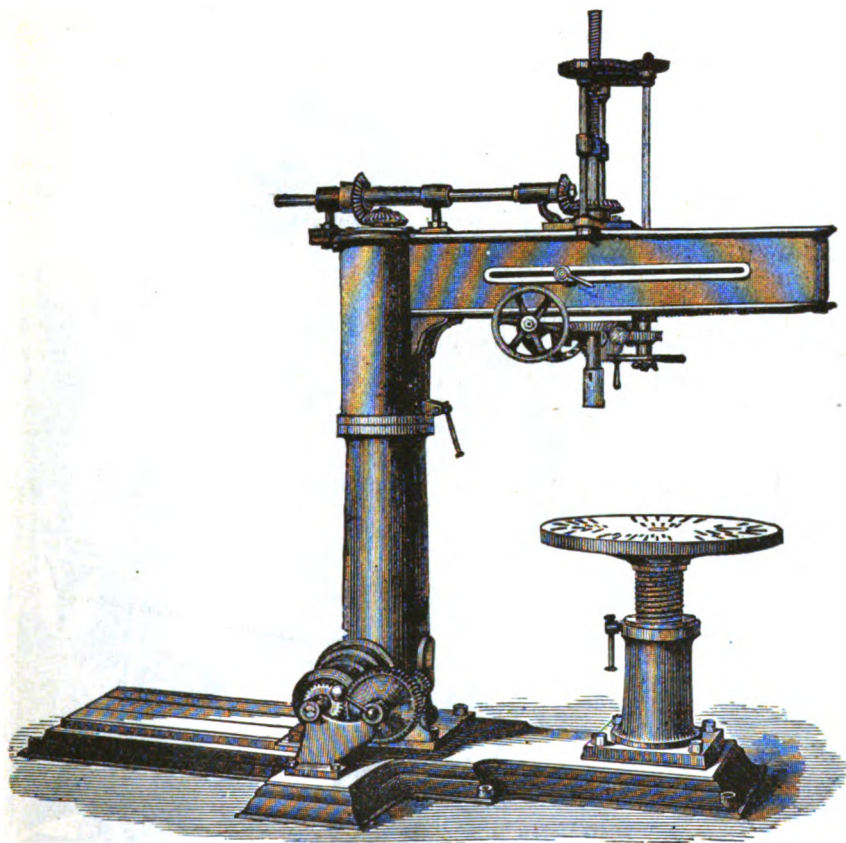


Fig. 1141.

The Radiating-Arm is fitted to the top of column, and traverses freely in all directions: in this slides the head, carrying the drill, spindle and gearing, which is moved backward and forward by a rack and pinion and hand wheels, one on each side of the machine. The arm is capable of being placed in any position, radiating from the column as a centre; hence the drill can be made to reach any point within the circle, except the part occupied by the belt and driving pulleys. Thus a large number of holes may be drilled in succession on the same surface without moving the work. Each machine is double back-geared and has an automatic feed motion. The extension base plate is planed off true and slotted so that any work that will not go on the Drill Table can be put on this true surface, while being drilled. These drills are especially useful in fitting up such work as Steam Engine Cylinders, Steam Chests, Bed Plates, &c.

No.	Reach or Swing.	From Arm to Base.	Spindle.	
			Diameter.	Vertical Movement.
1	36 inches.	4 ft. 5 in.	1½ inches.	10 inches.
2	48 "	4 ft. 10 in.	1¾ "	10½ "
3	60 "	5 ft. 8 in.	2½ "	13½ "
4	72 "	7 ft. 0 in.	3 "	20 "

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NEW HAVEN PLANER.

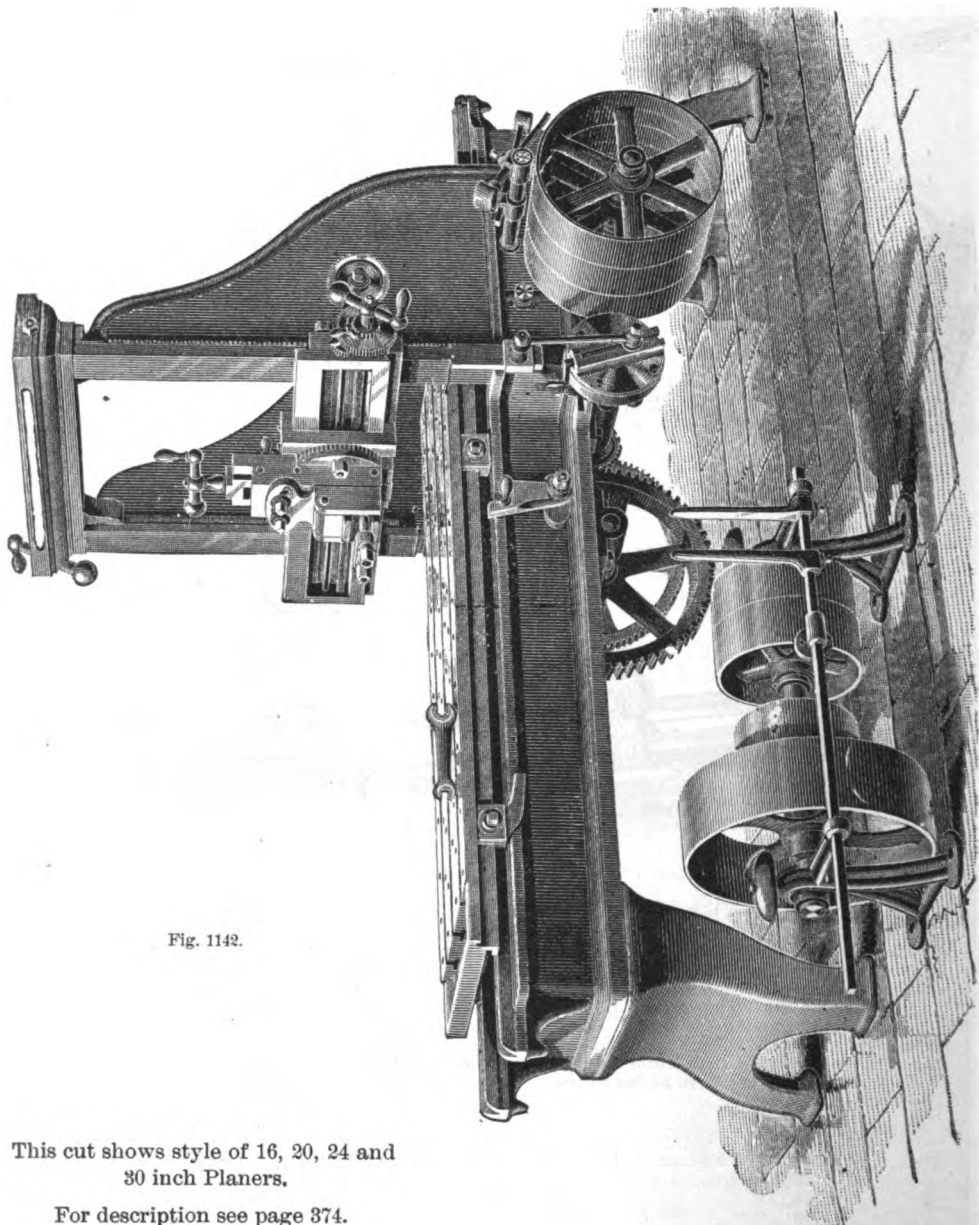


Fig. 1142.

This cut shows style of 16, 20, 24 and
30 inch Planers.

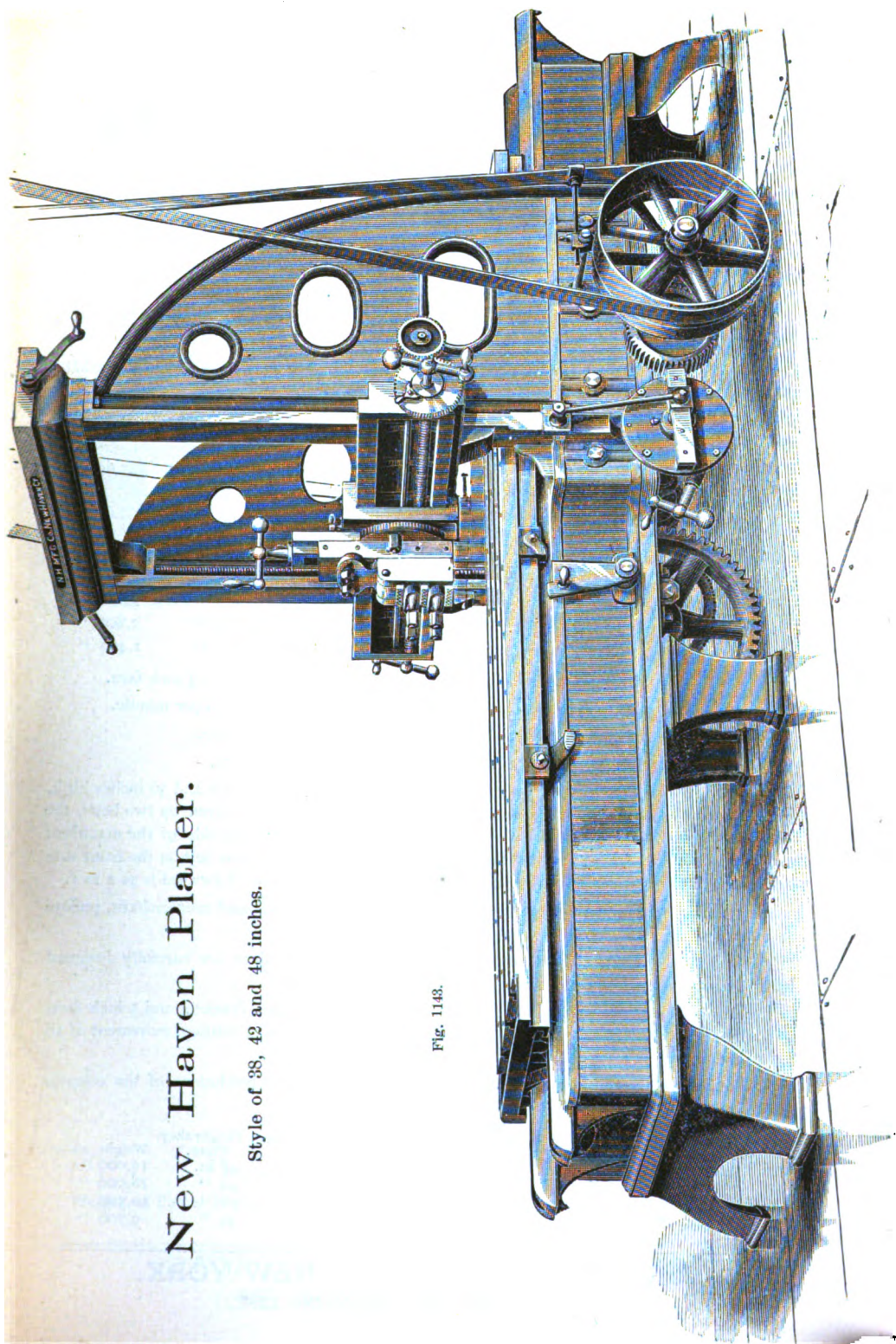
For description see page 374.

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FOR PRICES SEE ACCOMPANYING LIST.

New Haven Planer.

Style of 38, 42 and 48 inches.

Fig. 1143.



Description of Planers,

FIGS. 1142 and 1143.

Figure 1142 shows our No. 4 Planer, planes 5 feet long, 26 inches wide and 24 inches high, and represents in design the different sizes described herewith.

They are driven by two belts, and the driving pulleys are on the front side of the bed, except No. 5, which is driven by one belt, the pulleys being on the back side of the bed.

They are complete with automatic power feeds in all directions, overhead countershafts, pulleys and hangers, and wrenches.

The racks and gears are all cut from solid stock, holes in the tables are drilled and reamed, and bolt slots planed.

Above Planers are strong, substantial machines, built in the best manner, especially designed for accuracy of operation, and are fully tested before leaving the works.

No. of Planers.	Length of Bed	Length of Table.	Width of Table.	Length they Plane.	Width they Plane.	Height they Plane.	Weight, about.
2½	11½ ft.	9¼ ft.	27½ in.	8 ft.	32 in.	30 in.	7,500 lbs.
3½	10½ "	8 "	22 "	7 "	26 "	24 "	5,000 "
4	8½ "	6 "	22 "	5 "	26 "	24 "	4,200 "
4½	6¾ "	5 "	17½ "	4 "	22 "	20 "	2,800 "
5	4½ "	3½ "	13 "	3 "	16 "	16 "	1,400 "

No. 2½, speed of countershaft, 210 revolutions; pulleys 14 inch diameter, 4 inch face.

Nos. 3½ and 4, pulleys 12 inch diameter, and 4 inch face, 230 revolutions per minute.

No. 4½ pulleys, 10 inch diameter, 3 inch face, 245 revolutions per minute.

No. 5 pulleys, 9 inch diameter, 2¼ inch face, 235 revolutions per minute.

Figure 1143 shows our No. 2 Planer; planes 10 feet long, 38 inches wide and 36 inches high, and represents in design the larger sizes described below. They are driven by two belts, the main driving shaft having a tight and loose pulley attached to it on each side of the machine: the open belt on the back side drives the table while cutting, and the cross belt on the front side carries the table back; the backward motion compared to the movement forward is as 2 to 1.

They are complete with automatic power feeds in all directions, overhead countershafts, pulleys and hangers, and wrenches.

The racks and gears are all cut, and in other respects the machines are carefully designed with especial reference to convenience and accuracy of operation.

The driving pulleys on counter shaft to Nos. 0 and 1 are 14 inches diameter and 5 inch face, and a speed of 235 revolutions per minute of the counter shaft gives a cutting movement of 16 feet to the table.

Nos. 1½ and 2 are 14 inches diameter and 4 inch face, and 260 revolutions of the counter shaft gives a cutting movement to the table of 16 feet per minute.

No. of Planer.	Length of Bed.	Length of Table.	Width of Table.	Length they Plane.	Width they Plane.	Height they Plane.	Weight, about
0	20 ft.	17 ft.	33 in.	16 ft.	48 in.	48 in.	10,000 lbs.
1	20 "	17 "	33 "	16 "	42 "	42 "	18,000 "
1½	16½ "	13½ "	28 "	12 "	38 "	36 "	10,500 "
2	14½ "	11 1-6 "	28 "	10 "	38 "	36 "	9,700 "

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FOR PRICES SEE ACCOMPANYING LIST.

IRON PLANER to Plane 26 in. Wide by 26 in. High.

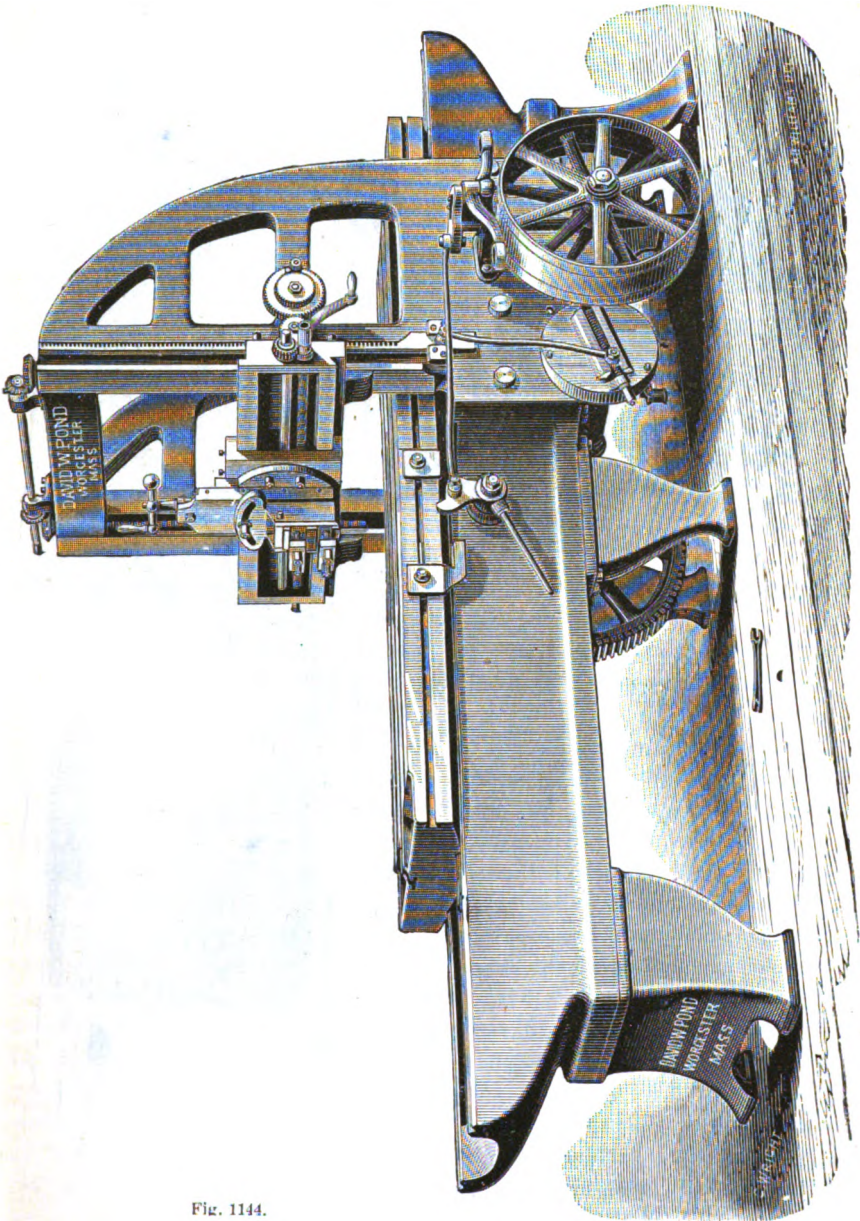


FIG. 1144.

Weight of Planer to plane 5 feet, 4,900 lbs. Extra per foot up to 12 feet, about 500 lbs.
For description see page 377.

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FOR PRICES SEE ACCOMPANYING LIST.

IRON PLANER to Plane 32 inches Wide by 32 inches High.

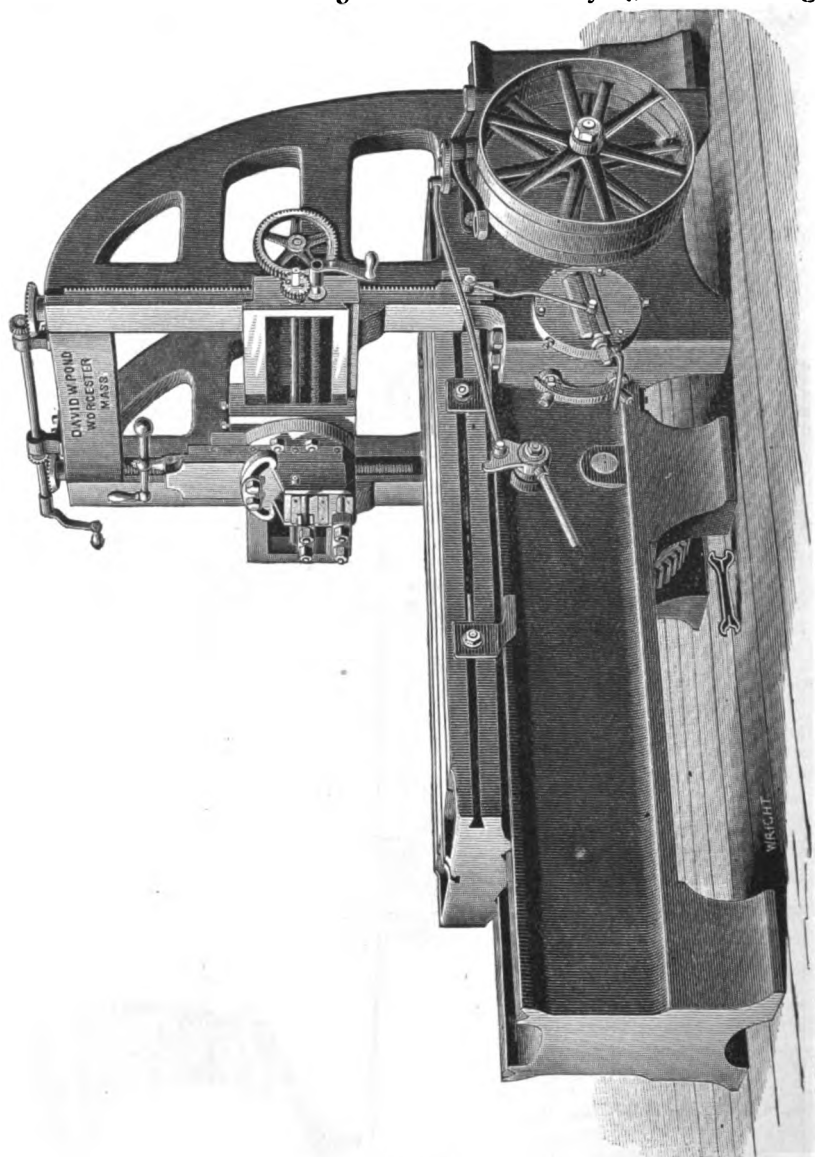


Fig. 115.

Weight of Planer to plane 6 feet, 9,400 lbs.

Extra per foot up to 10 feet, about 750 "

" " above 10 " " 1,000 "

For description see page 377.

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FOR PRICES SEE ACCOMPANYING LIST.

DESCRIPTION OF IRON PLANERS.

Figs. 1144 and 1145.

NEW DESIGNS

Made from entirely new and very heavy patterns (including new features patented) giving parts subjected to greatest strains an unusual size.

BEDS have great depth and sufficient length to prevent table from tipping when heavily loaded on overhanging ends.

TABLES are thick, with bolt slots truly planed and pin holes carefully reamed for convenience in fastening work.

UPRIGHTS or POSTS are very heavy and stiff, having great breadth of base, making it possible to take heavy cuts when bar is at greatest height from table, without jar or chatter; uprights are designed to allow greatest possible amount of light upon work.

A POWERFUL TRAIN OF CUT GEARS, CUT RACK ON THE TABLE, SHAFTS OF LARGER DIAMETER with bearings double the usual length, all making a machine that will plane surfaces truly and without chatter.

THE PATENTED FEEDING DEVICE gives automatic feed in all directions, is adjustable from fine to very wide cuts for finishing, and takes no power except when feeding.

THE CRANK for operating the cross feed by hand can be applied to end of rod in bar, thus operating the vertical and angular feeds by hand when the handle on perpendicular feed screw is not within easy reach.

To return the table after the cut, in quickest practical time, can best be effected by open and cross belts, and pulleys of different diameters on countershaft, thus dispensing with extra gears; speed can be increased or diminished by purchasers to meet their requirements by changing the countershaft pulleys.

PATENTED AUTOMATIC BELT SHIFTER transfers but one belt at same time, thereby preventing two belts running in opposite directions from being on tight pulley at the same time, thus obviating "squealing" of belts and jar of machine; it is entirely disconnected from feeding apparatus, hence works easily, giving operator quick and perfect control over movements of the table without using the countershaft shipper; is arranged to throw out to clear the reversing dogs on the table which can then be run backward to examine the work, the dogs not being loosened retain necessary stroke and also allow a temporary adjustment of stroke to places not in the limit fixed by the position of the dogs.

Wrenches, complete countershaft, etc., etc., are furnished. Machines, with small parts suitably boxed, are delivered at Depot, ready for shipment. Extra heads can be supplied for any size at additional cost. Machines can be furnished to plane any desired length.

Particulars and estimates for 38, 42, 52 and 60 inch Planers on application.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

HAND SHAPING MACHINE.

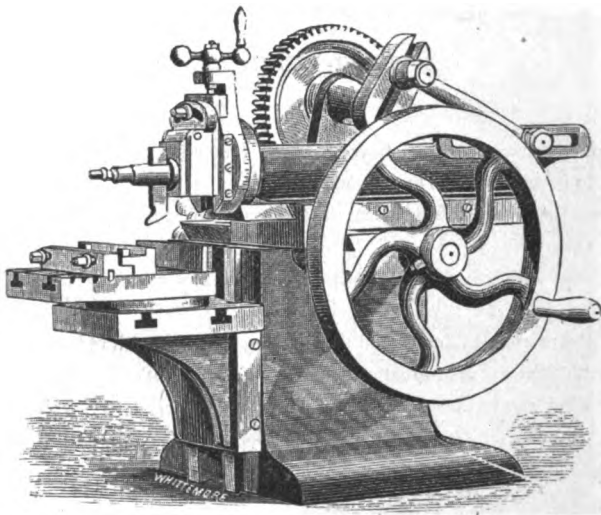


Fig. 1146.

This machine is nicely designed, well made, firm, and will carry a heavy chip. The Packings, Driving Shaft, and Feed Screws are of Steel. The sliding parts are all well fitted. The Screws and other parts, where necessary, are case hardened. The Head is indexed for planing bevels, and is a complete machine in all its appointments, and a desirable Tool for Model Makers, Die Sinkers, Railroad Shops and all other Shops where machine work is done.

This machine has a Stroke of six inches, and may be readily adjusted to work any less distance.

Length of Traverse6 inches.
Vertical Adjustment of Table.....5 inches.

The surface of the hand wheel is made flat so as to carry a belt when wanted for power. Weight, 225 pounds. Also furnished mounted on stand same as for power.

22 CORTLANDT STREET, NEW YORK.
 FOR PRICES SEE ACCOMPANYING LIST.

POWER SHAPING MACHINE.

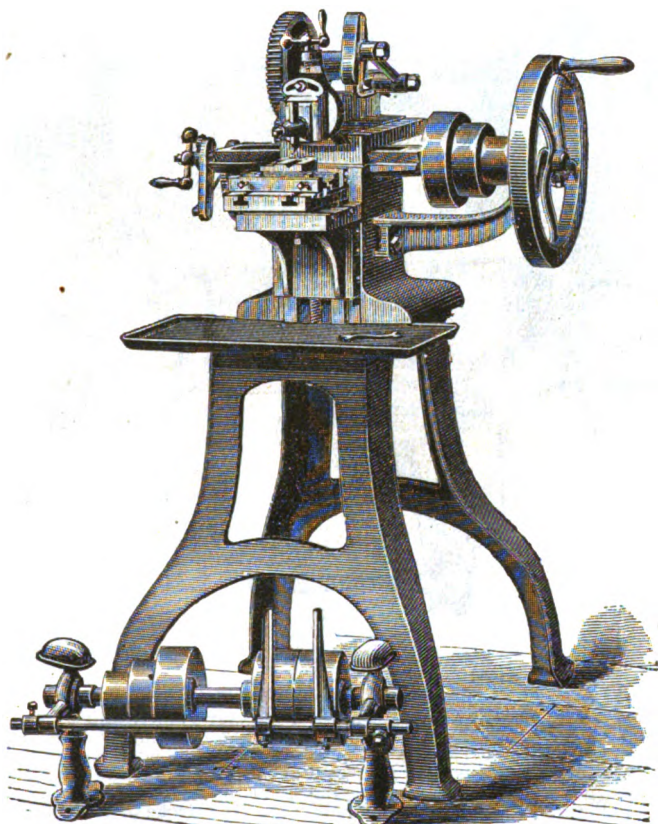


Fig. 1147.

Weight, including Counter Shaft, 350 lbs.

This machine is the same as figure 1146, except that it is arranged for power. EIGHT inch shaper of same style, has $8\frac{1}{2}$ inches traverse, 7 inches vertical adjustment, and weighs 600 lbs.

SHAPER CENTRES.

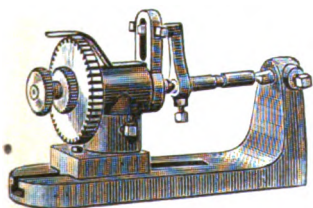


Fig. 1148.

This cut represents a pair of Centres to go with Shaper when wanted, which will be found very useful in Fluting Reamers, Taps, &c.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

IMPROVED SHAPING MACHINE.

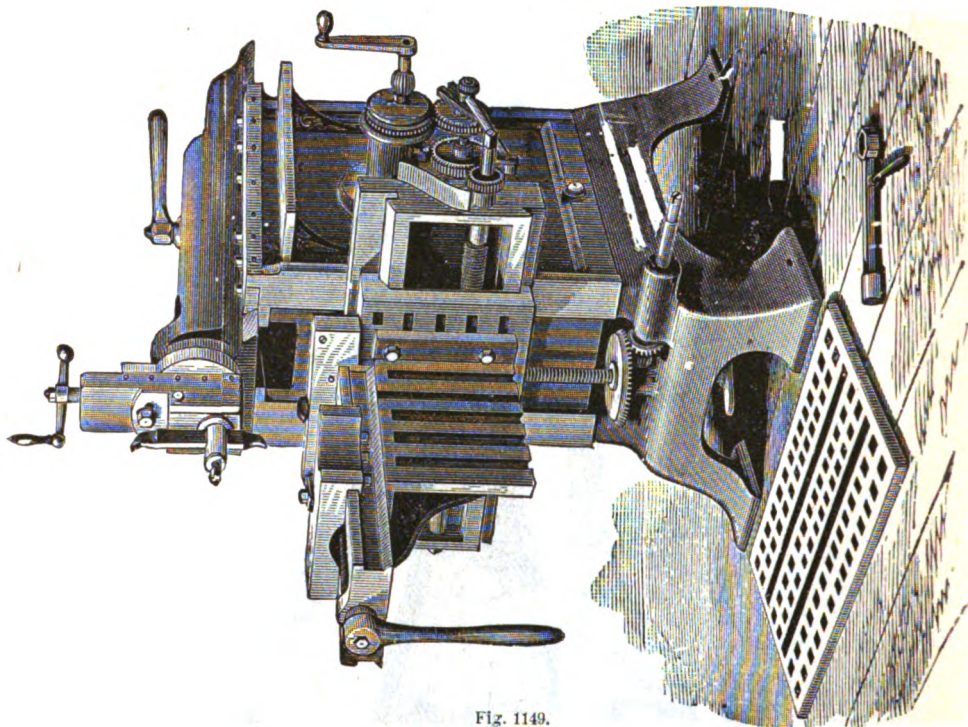


Fig. 1149.

PATENTED MAY 17th, 18 1.

This represents our Patent Shaping Machine, or Circular Planer, with a Swivel Vise, steel-faced jaws projecting outside to hold long or short work for planing it on ends, such as punches, rods, &c. Work can be fastened as quickly as in the common vise at any angle, or plane any bevel. The tool bar is heavy, and is worked by our Patent Adjustable Crank motion and slotted lever; it gives a slow motion for planing, and a quick return. It can be instantly set to give any required stroke while in motion or at rest. The stroke of each machine is graduated, and a pointer indicates the length it planes. Adjustable centre on vise raise and lower; automatic brake to stop quickly; bearings are large and long, and machines will take heavy cut; the large gears have extra large bearings to wear well; vise is quickly replaced with face plate by one bolt; cross slide stops automatically at each end; machine can be kept at work with little attention; is self-feeding, across or circular. Dies, racks, key seats, cranks, and many parts of all machinery can be planed quicker than on ordinary planer, with a saving of files, time, &c.

Our Shapers are acknowledged by Practical Mechanics to be the BEST TOOLS NOW MADE, for work within the range of a Shaper on general work. We have over six hundred in use; some firms have from one to nine machines in use; they are also largely in use in Railroad shops.

We furnish face plate, countershaft and wrenches: also to order, circular mandrel index centre, with worm wheel, &c All have 4 speed cones. Eight and ten inch counter should make 130 revolutions; all others 160.

Stroke.	Planes' Width.	Height.	Diam. and Face of 2 Counter Pulleys.	Weight, about
8 in.	14 in.	6 in.	8x4	900
10 "	17 "	9 "	11x6	1,100
15 "	22 "	11 "	11x6	1,550
20 "	28 "	12 "	12x6	2,300
25 "	28 "	13 "	14x6	3,100

Index centres, Circular Mandrels, and Rack Cutting Attachments for 15, 17 and 20 in. Stroke furnished, when desired.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

No. 2 SHAPER, 12-INCH STROKE.

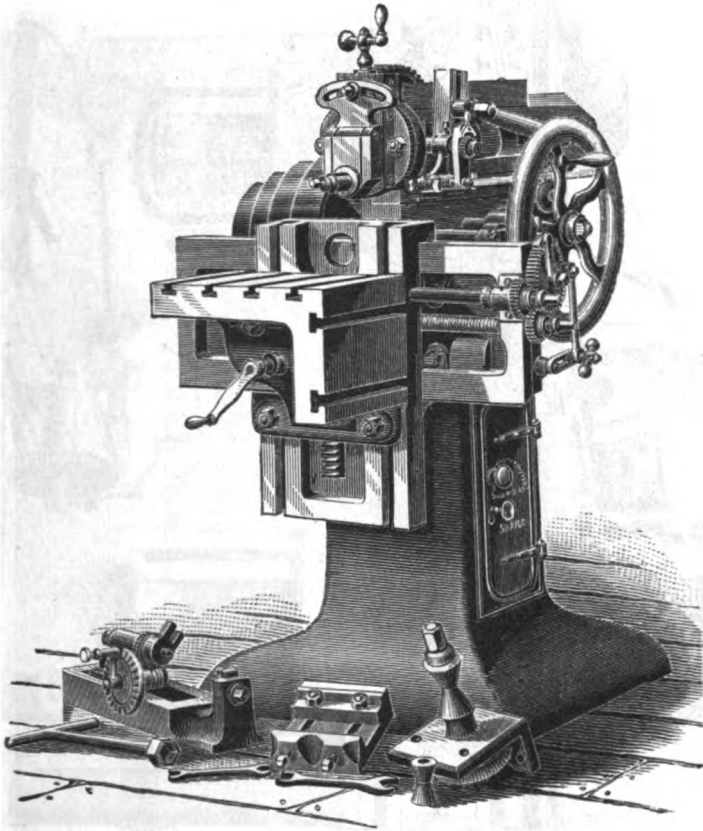


Fig. 113.

Has quick return motion, automatic power feeds in all directions, arbor, for circular planing, planer centres, vise or chuck, wrenches, countershaft, hangers and pulleys.

DIMENSIONS:—Stroke 12 in., traverse, 13 in., cone pulleys $2\frac{1}{4}$ in. face. Driving pulleys 14 in. x 4 in. Weight 2,400 lbs.

No 1 shaper, 16 inch-stroke—Fig. 1151. Has two angle tables, with movable head, and is in other respects complete as described above.

For cut see page 382.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

No. 1 SHAPER, 16-INCH STROKE

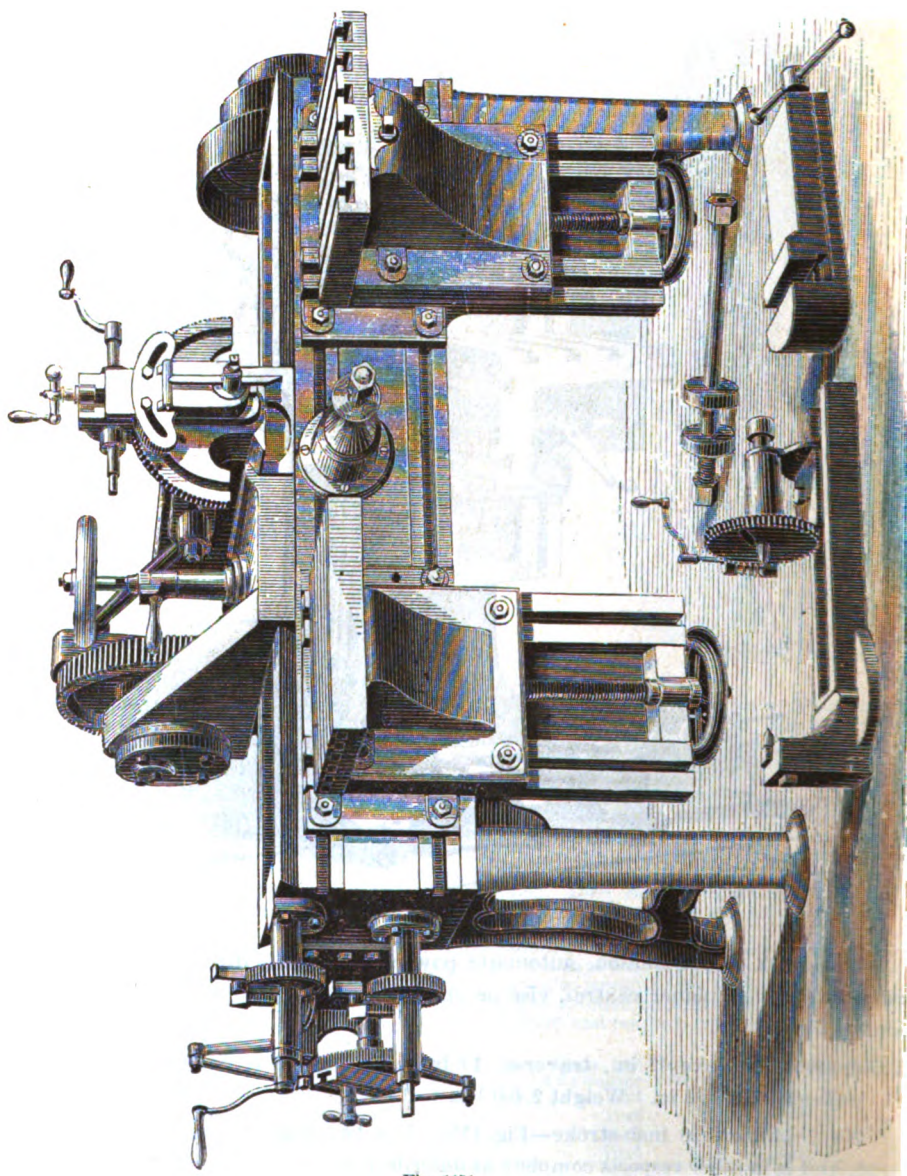


Fig. 1151.

For Description see page 381.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

NEW PATTERN MILLING MACHINES.

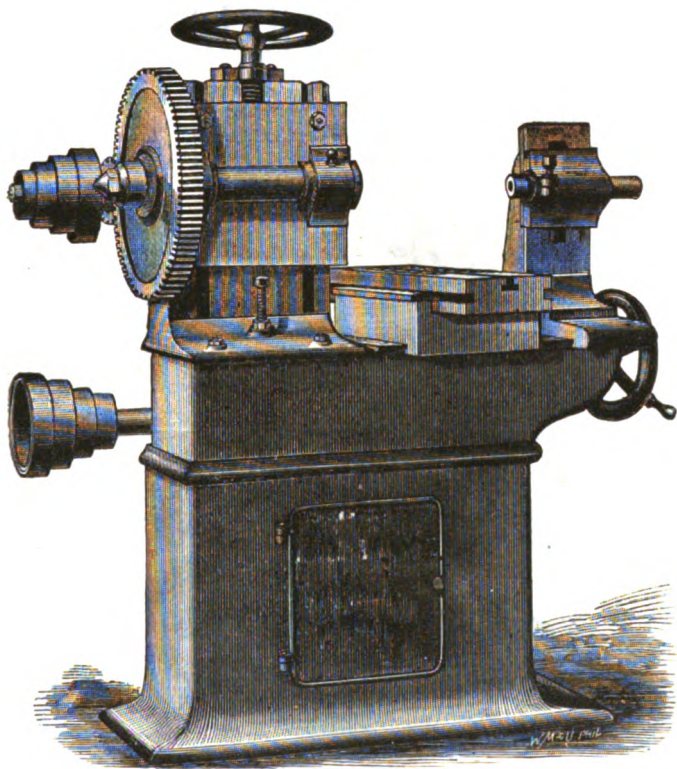


Fig. 1152.

These massive tools are much preferred by Manufacturers to the ordinary Gun Milling Machine. They have an entirely new and improved self feed and automatic stop motion. The distribution of metal is most perfect and the workmanship is of the highest order.

No. 1, for Sewing Machine Factories, Armors, etc., has a carriage 30 inches long by 8 inches wide, vertical adjustment of spindle 10 inches above carriage. Three changes of speed and feed.

No. 2, for Electric Light Manufacturers, etc., has a carriage 34 inches long, 9 inches wide, vertical adjustment of spindle 11 inches from carriage. Three changes of speed and feed.

No. 3, for Locomotive Works has a carriage 42 inches long by 12 inches wide, vertical adjustment of spindle 12 inches from carriage. Three changes of speed and feed.

The carriages of any of these machines can be lengthened or any other alterations made to suit the purchaser.

Milling Machines of every kind, Cotter Drills, Gear Cutting Machines, Slotting Machines, Shaping Machines, Nut-Finishing Machines, Drill Presses, Boring Machines, etc., etc.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

UNIVERSAL AUTOMATIC GEAR CUTTER.

(Patent Pending.)

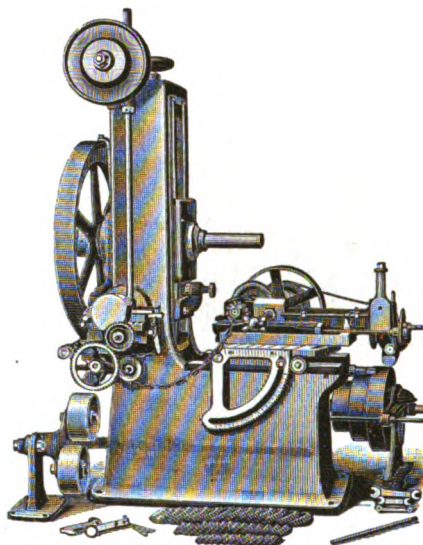


Fig. 1153.

MACHINES WILL CUT UP TO		CLASS OF WORK.	WEIGHT, ABOUT	COUNTER PULLEY.	REV. PER MINUTE.
DIAM. IN INCHES.	WIDTH OF FACE IN INCHES.				
25	5	For light and medium work	1,000 lbs.	.....	.....
30	8	Medium and heavy work,	1,900 "	12x3 in.	120
40	8	" " "	2,100 "	12x3 "	130
50	10	" " "	2,500 "	14x3 "	140
84	12	" " "	.....	14x4 "	140

Orders for smaller or larger sizes to cut any required pitches solicited.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

UNIVERSAL AUTOMATIC GEAR CUTTER.

DESCRIPTION.

With it we can cut without attention, either bevel spur or worm gears, and after the machine has been set and started the cost of running is *nothing*. For instance, the workman sets the blank to be cut, and adjusts the machine, starts it running and then he can go about other work, and let the machine take care of itself.

WHY IT IS CALLED "AUTOMATIC."

First.—Because the *Machine feeds* the cutter through the wheel *itself*.

Second.—Because the *Machine* draws the cutter out *itself*.

NOTE—*Machine withdraws cutter 32 times as fast as it feeds it. The feed has 12 changes of speed.*

Third.—Because the *Machine* makes every change or division of worm wheel *itself*.

NOTE.—*It makes the divisions with perfect accuracy, neither can it make any mistake, when properly set. In a hand machine mistakes are liable, and often occur.*

Fourth.—Because the machine after it is done cutting a wheel, strikes a gong, thus notifying the workman to come and put in another wheel.

This machine is fully warranted to be correct, with workmanship and materials first-class.

They have V tooth worm and worm dividing wheels.

Adjustable Rim support to take the strain of cutter on large wheels.

Adjustable stops for worm wheels, completely locking the worm wheels, while each tooth is cut.

Very large bearings and wearing surfaces (Mandrel on 50 inch is over 4 inch diameter).

Are geared up very strong.

They Cut with PERFECT ACCURACY.

Will cut smooth tooth without chatter.

Will allow withdrawing the worm from dividing wheel to test large wheels before cutting them.

Have twelve changes of cutting feed to suit cast iron, wrought iron or steel.

QUICK RETURN to cutter slide 32 to 1 (on 30 inch and over, a new important feature).

They carry away the chips automatically. (New device.)

Have dial for setting cutter to within a thousandth of an inch in depth.

Gauge to set the cutter exactly to centre of mandrel.

Graduation for setting over for worm wheels and bevel gears.

Graduated quadrant adjustable to a *thousandth part of an inch* for cutting bevel gears.

Large and quick adjustment of cutter shaft for cutting bevel gears.

They have 44 change gears, and will CUT ALL except prime numbers to 200, and also a VERY LARGE RANGE OF HIGHER NUMBERS.

They can be set by any person of ordinary intelligence.

All wrought iron work and bolts, subject to wear, are CASE HARDENED.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

NINE-INCH SLOTTING MACHINE.

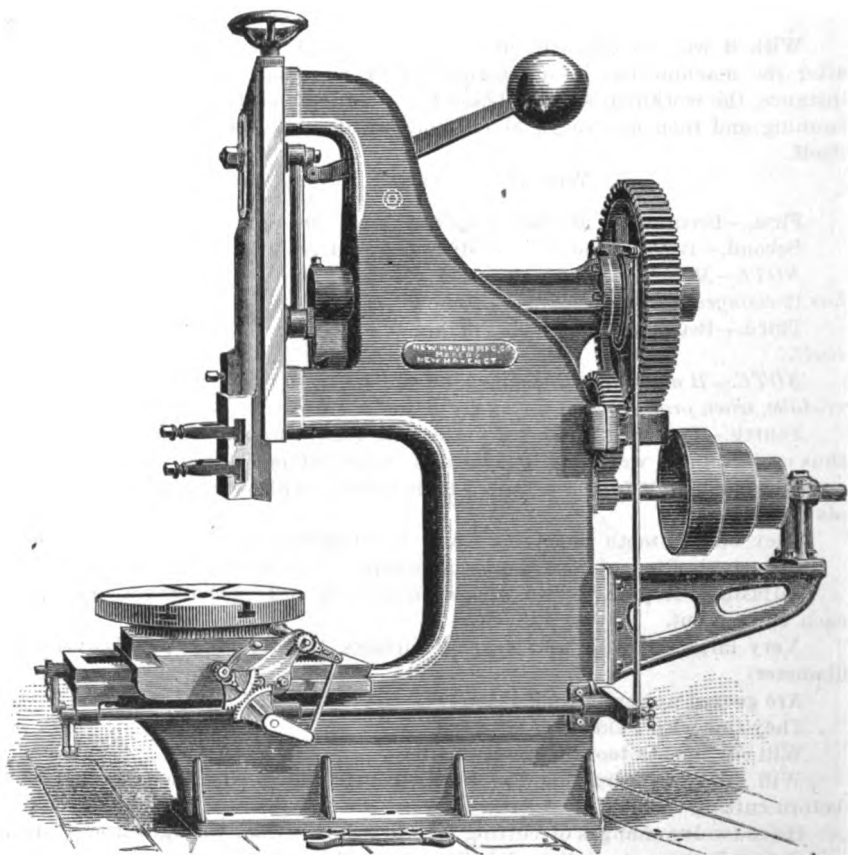


Fig. 1154.

Will admit a wheel 40 inches in diameter. Cutter bar has a movement of $9\frac{1}{2}$ inches, and is adjustable by hand wheel to 9 inch stroke or less, and has quick return motion. The circular table has power feeds in all directions. Complete with counter-shaft, pulleys and wrenches. Cone pulleys 4 in. face, driving pulleys 16 in. x 4 in. Weight 4,400 lbs.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE "ECLIPSE" HAND PIPE-CUTTING MACHINE.

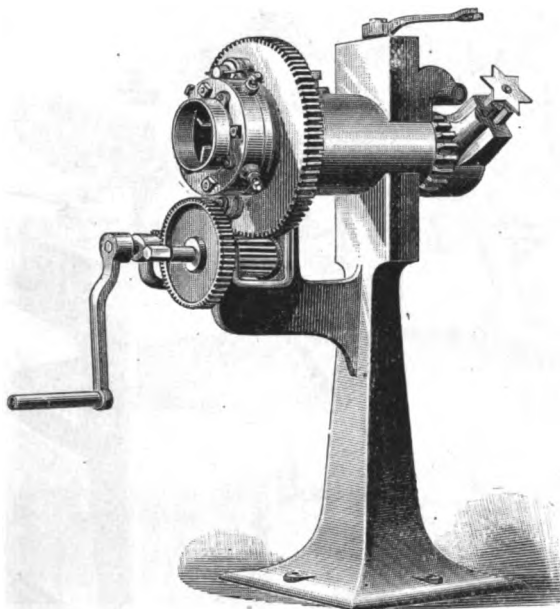


Fig. 1155.

It is substantially built, and designed to work easily and without undue strain on any of its parts, and is at the same time very compact and portable.

It will cut off and thread 2½, 3, 3½, and 4-inch Pipes, and is so powerfully geared that a stout boy can easily cut and thread 4-inch Pipe with but a 12-inch Crank.

WE INVITE ATTENTION TO SOME OF ITS DESIRABLE FEATURES.

1st.—THE GREAT LENGTH, between the die and gripping-chuck, which secures a perfect and straight thread.

2d.—THE GEARING ARRANGEMENT, which reduces the labor to the minimum, the gear for the die being 23 to 1, giving great power in threading, and, by changing the crank, backs off the die very rapidly. On the cutting-off end the gear is 23 to 1, and furnishes ample power to run two cutting-off tools simultaneously, which are fed up to the work automatically, and thus greatly reduces the time in cutting.

3d.—THE GRIPPING-CHUCK makes a most convenient and powerful Pipe-Vise for screwing on or removing fittings from the various sizes of Pipe.

4th.—IT CAN BE ERECTED almost anywhere, requires but little space, and being all on one stand, no other setting is required than four bolts or lag screws through base plate.

5th.—THE CHUCK that holds the dies being fed by a leader-screw, requires no pressure or forcing in starting a thread, but leads the pipe up to the cutters without effort on the part of the operator.

6th.—THE ECLIPSE MACHINE is so constructed that the parts most liable to wear can be replaced at small cost.

PIPE-FITTERS AND INDUSTRIAL ESTABLISHMENTS,

who have occasion to cut Pipes within the range of the "Eclipse," will find it a most convenient and labor-saving tool, and, as such, we invite their attention to it.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

I. X. L. Pipe Threading and Cutting Machine. FOR PIPE FROM $\frac{1}{4}$ TO 2 INCH.

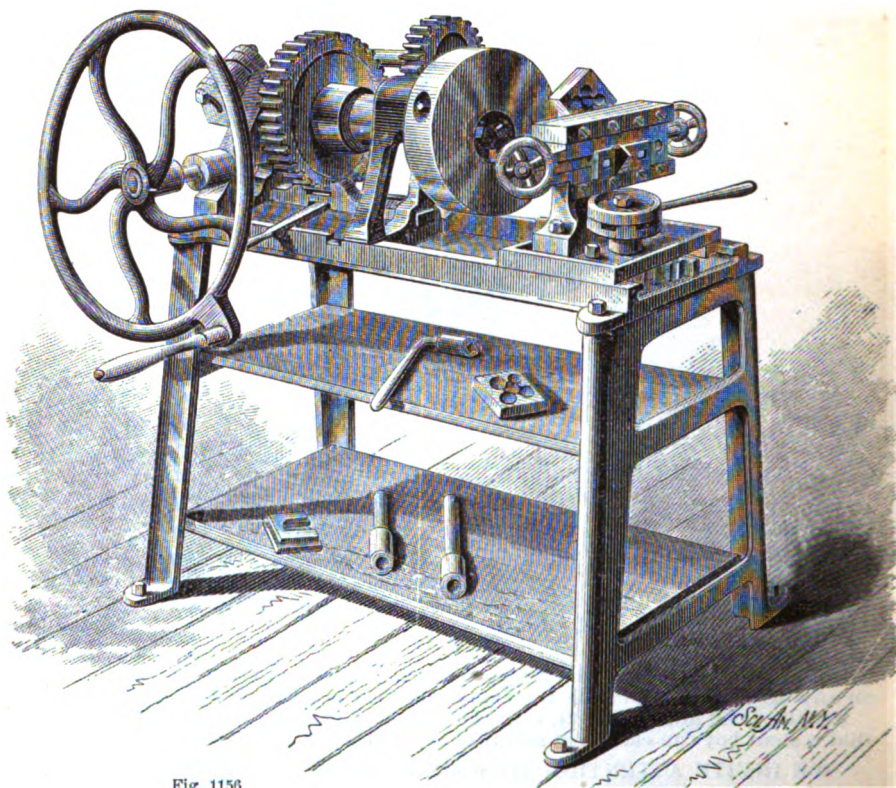


Fig. 1156.

These Machines are the cheapest, most substantial and best fitted in the market. They are made to work by HAND ONLY, or by HAND AND POWER.

Pipe Threading and Cutting Machines. FOR POWER ONLY.

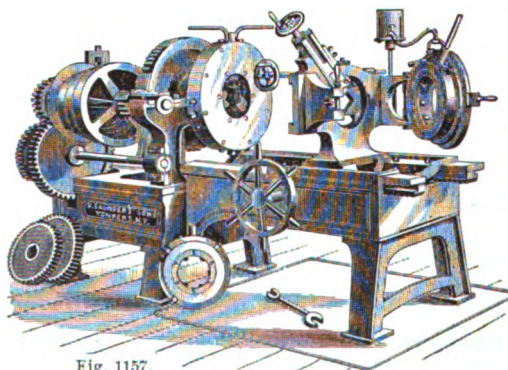


Fig. 1157.

No.	Sizes cut.	Weight.
3,	$\frac{1}{4}$ to 3 inches.	2,200 lbs.
4,	1 to 4 "	2,800 "
5,	$1\frac{1}{4}$ to 6 "	4,500 "
6,	$2\frac{1}{4}$ to 8 "	5,400 "
7,	4 to 12 "	

Hand attachment can be furnished with Nos. 3 and 4 at an extra charge.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

BOLT THREADING AND NUT TAPPING ATTACHMENT

—FOR THE—

I. X. L. PIPE THREADING MACHINE.

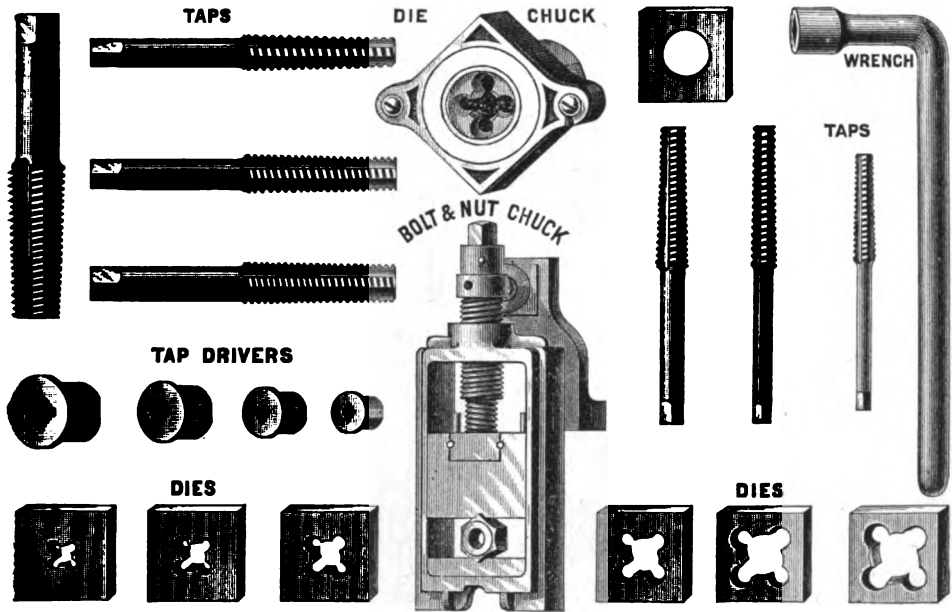


Fig. 1158.

In using the attachment, place the bolt and nut chuck in the die holder of screwing head, bolt the bracket on back of bolt and nut chuck to the screwing head, and grip the die chuck with the gripping chuck of machine, and it is ready for use to thread bolts. To tap nuts, grip the tap drivers in the chuck of machine. With this attachment, it threads bolts and taps nuts $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1\frac{1}{8}$ and $1\frac{1}{4}$ inches with solid bolt dies for iron size, (that is 1-32 over standard sizes), and taps for same.

Other sizes taps and dies at extra cost. Unless advised to the contrary, we fill orders with V threads.

 22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

No. 2

Improved Tapping Machine.

(NEW DESIGN) FOR STEAM AND GAS FITTINGS.

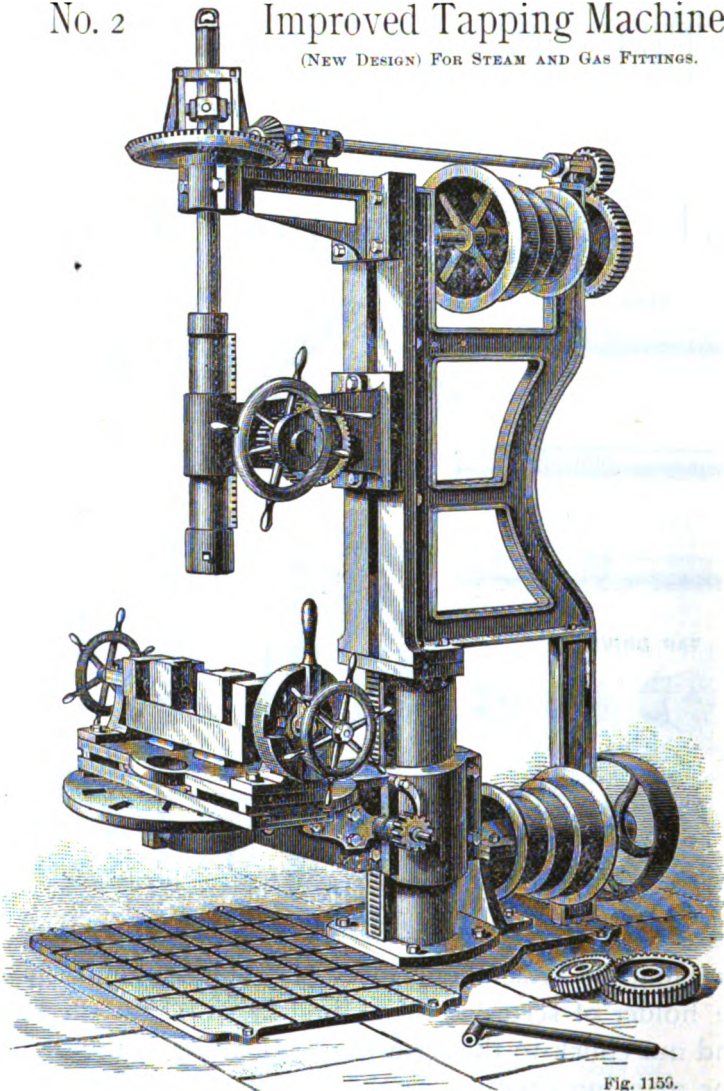


Fig. 1159.

The above cut represents a machine which has been designed for general use, as well as for Steam and Gas Fittings.

1. It is arranged in regard to speed and power to tap fittings for $\frac{1}{4}$ to 3 inch pipe. It is also well adapted to tapping all the miscellaneous articles used in steam and gas fitting.

2. Having a round column and table, the table can be readily raised, lowered, or swung out of the way. There being a large space between the point of the spindle, the base, which is planed true answers as a table. Very large pieces of work can be placed under the drill. The space from centre of spindle to column is eighteen inches; frame, seven feet high.

3. The spindle is counter-balanced, and has an attachment for reducing the friction on same, which is very essential to a tapping machine.

4. A self-feed also attached when desired. This, and the other improvements mentioned, making a powerful and excellent drilling machine for general work.

SPEED OF LOWER CONE SHAFT.

Revolutions per minute, 150.

Weight, complete, 3,500 lbs.

22, CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

LIGHTNING BOLT CUTTERS

— AND —

NUT TAPPERS.

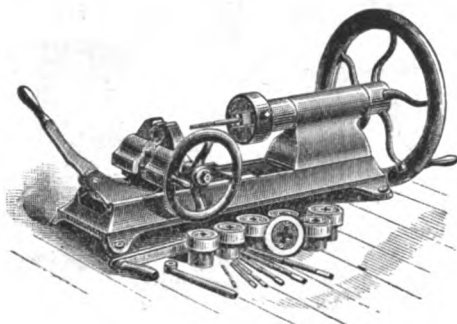


Fig. 1160.

No. O.—Hand Bolt Cutter and Nut Tapper, especially for crooked work. Made to be bolted to the Bench or Table. Fitted with seven sizes, from $\frac{1}{4}$ to $\frac{3}{4}$ in. Usual assortment, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ in., with taps, dies in collets, etc., complete. Weight 200 lbs.

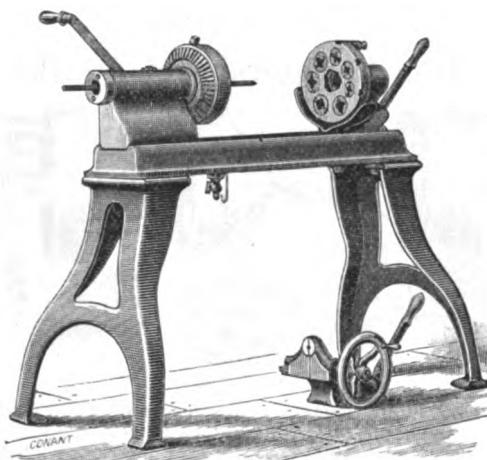


Fig. 1161.

No. 2 $\frac{1}{4}$ —Hand Bolt Cutter and Nut Tapper, fitted with seven sizes, from $\frac{1}{4}$ in. to 1 in., inclusive. Usual assortment, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$ and 1 in.; all $\frac{1}{16}$ over exact standard, unless otherwise ordered, complete with taps, dies, nut chuck, etc.

No. 1 $\frac{1}{4}$ —Hand Bolt Cutter and Nut Tapper, complete as above, but without the legs. Weight 225 lbs.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

No. 5 Lightning Bolt Cutter and Nut Tapper.

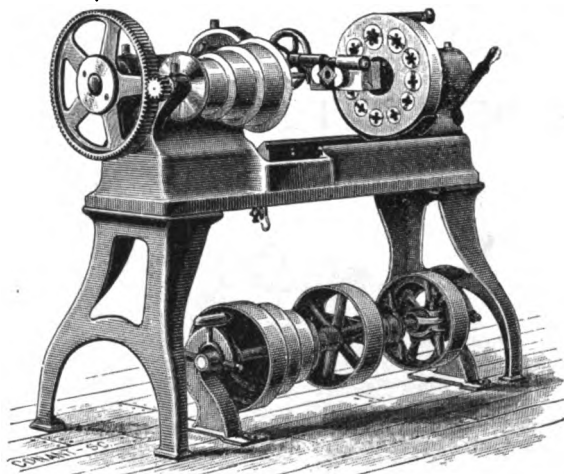


Fig. 1102.

ASSORTMENT 1.

Machine complete, with taps and dies for bolts and nuts— $\frac{1}{8}$, $\frac{1}{16}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$ inches, complete, with countershaft, etc.

ASSORTMENT 2.

Machine complete, with taps and dies for bolts and nuts— $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, 1 , $1\frac{1}{8}$, and $1\frac{1}{4}$ inches, complete, with countershaft, etc.

Patent Friction Countershafts for Bolt Cutters.

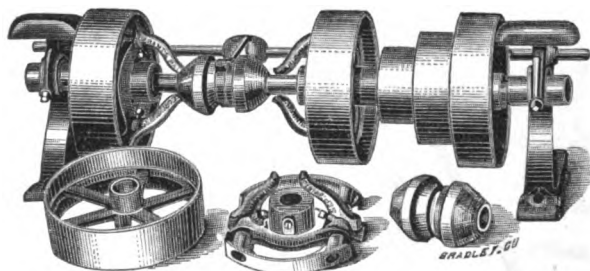


Fig. 1163.

These pulleys will be found perfectly noiseless, smooth and easy in their operation, while having at the same time tremendous power.

Each pulley is constructed with two right and left screws, of very steep pitch, which being turned by the action of the wedge-shaped thimble, apply the friction irresistibly at the touch of the operator, and release the pulley instantaneously upon reversal of the action.

They cannot slip.

They cannot stick.

They cannot work loose.

Of great simplicity, there are very few parts, and they of a nature to act with directness and positiveness, so as never to be out of order. They are readily adjusted.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

DAVIS' PATENT BOLT HEADER.

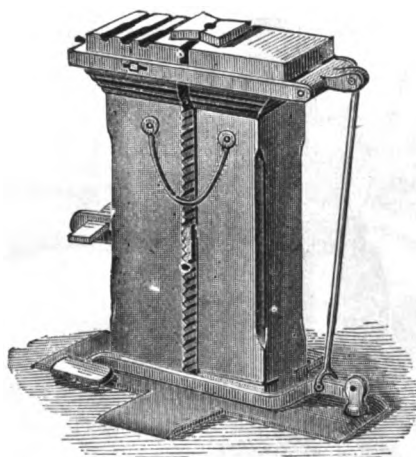


Fig. 1164.

DESCRIPTION.

A sliding head or "dog" is arranged with $\frac{3}{8}$ teeth, which mesh in a corresponding row of teeth running nearly the entire length of the stationary pillar of the machine. By the simple loosening and retightening of a key, the "dog" can be moved and firmly secured in any position—by which the length of the bolt is determined. *These teeth will not break off*, and have a decided superiority over any form of screw, the threads of which would be constantly upsetting and clogging. In many shops a solid cast block is used, with pins to graduate the length. A great many of these pins are required, and are often being lost, wasting more time frequently than it would take to do the job.

SIZES.

No. 1, for Bolts. from $\frac{3}{8}$ to 1 inch.

No. 2, for Bolts. from $\frac{3}{8}$ to $1\frac{1}{2}$ inches.

Price includes everything necessary to make either square or hexagon Bolts.

Weight of No. 1. 525 lbs.

Weight of No. 2. 700 lbs.

Will make Bolts from 1 inch to 2 feet long.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

SCHLENKER'S PATENT AUTOMATIC REVOLVING-DIE BOLT CUTTERS AND NUT TAPPERS.

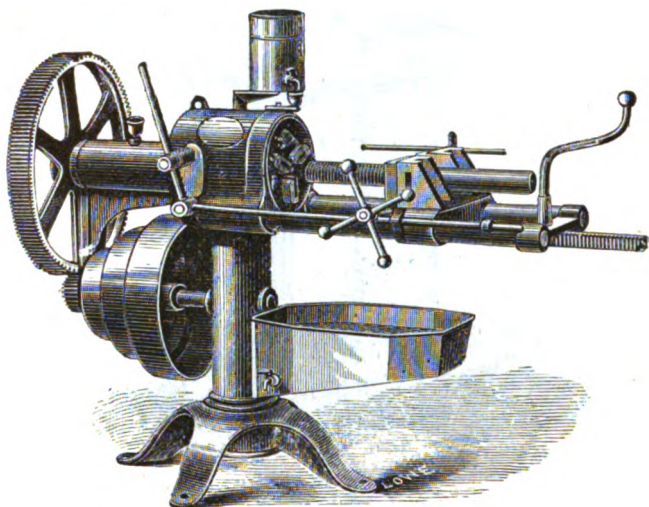


Fig. 1165.

Above Cut represents the Single-Headed Machine.

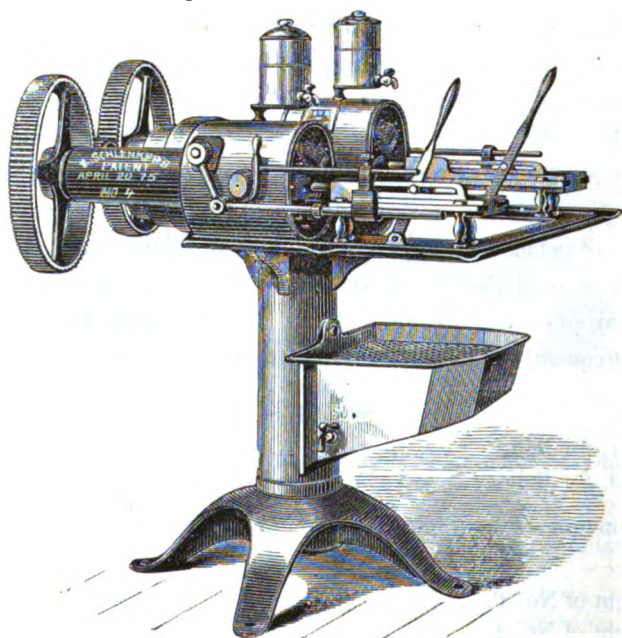


Fig. 1166.

Above Cut represents Double-Headed Machine.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

DESCRIPTION OF

SCHLENKER'S REVOLVING-DIE BOLT CUTTER.

OUR NEW REVOLVING-DIE MACHINE is now recognized by practical machinists to be the perfection of a Screw Cutting Machine. It possesses many advantages over any competitor. The dies are opened automatically when the desired length of thread has been cut on the bolt, and are closed by the lever, or automatically as shown in the cut of the machine. It can be changed from one size to another in less than a minute without removing a bolt or pin. It does not require skilled labor, but can be operated by any competent boy. The dies are arranged to open and close automatically, therefore do not require the constant attention of the operator. It is a very rapid worker, its capacity being from 3000 to 3500 $\frac{5}{8}$ bolts, with $1\frac{1}{2}$ inches of thread, per day—and larger bolts in proportion. Threads cut by these machines will not vary $\frac{1}{2}$ thread in length on ten thousand bolts. The machines are simple in construction, very compact and strongly built, and are offered much below the price of any other machines capable of cutting the same sizes, and amount of work. It is adapted to cut right and left hand. V threads, square threads, and coach screws—will take in crooked as well as straight work, and cut any length of bolt. The machines are now largely in use, and we offer them to the trade as one of the most complete machinists' tools in the market.

Every machine is warranted as recommended.

SIZES.

No. 4	Double-Headed, Cuts from $\frac{1}{4}$ to $\frac{7}{8}$ inclusive,	16 set of Dies, }
	Weight, 1,550 lbs.	
No. 5	Cuts from $\frac{1}{4}$ to $1\frac{1}{4}$ inclusive,	9 sets of Dies, Weight, 950 lbs.
No. 5 $\frac{1}{2}$	“ $\frac{3}{8}$ to 2 “ 14 “ “ “ ... “	1,700 “
No. 6	“ $\frac{3}{8}$ to 3 “ 18 “ “ “ “	2,600 “
No. 7	“ $\frac{3}{8}$ to 3 “ 18 “ “ “ “	2,750 “
No. 8	“ $\frac{7}{8}$ to 3 “ 14 “ “ “ “	2,150 “

No. 7 has Nut-Tapping Combination, and is, in fact, two machines in one. Nuts can be Tapped and Threads Cut at the same time.

Nos. 6 and 7 have *Oil Pumps* instead of Can.

Price includes Dies, Master Taps or Hobs, Nut Tap Holders, Dies and Steel Chuck for Nut Tapping, and Counter Shaft Complete. BUT NOT NUT-TAPS.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

MERRIMAN'S IMPROVED BOLT CUTTER.

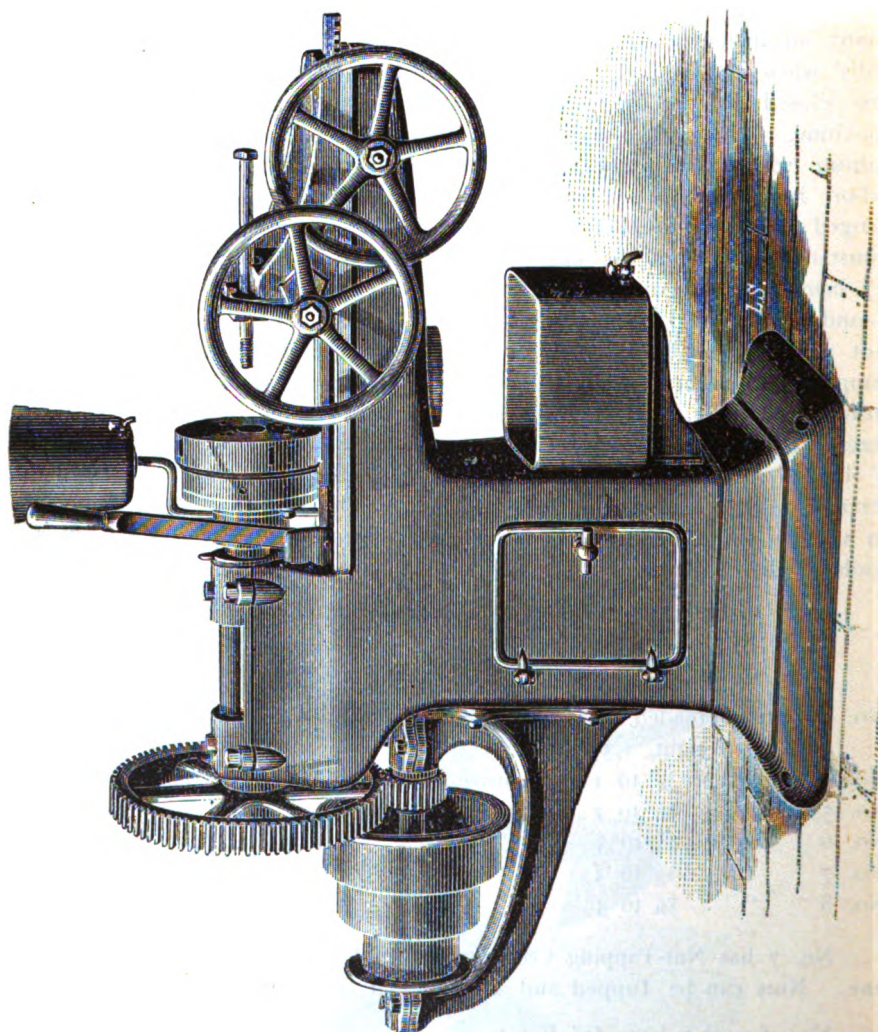


Fig. 1167.

With Patent Adjustable Heads and Dies to compensate for Wear; a full set of Taps and Tap-Sockets for Tapping Nuts for each size of Machine as shown in Schedules; Counter Shaft, Cone, Pulleys and Hangers for each Machine; the whole finished in the best style, and all wrought iron work case hardened.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

MERRIMAN'S IMPROVED BOLT CUTTER.

ITS POINTS OF MERIT.

1st. The thread is cut with the dies, which are fixed in the head and revolve around the bolt, which is held stationary in a vise, operated by a right and left screw on the shaft of the small hand wheel. The bolt carriage is moved forward and backward by a rack and pinion operated by the large hand-wheel. This is much more convenient, especially with long bolts, than to revolve the bolt.

2d. The dies cut thread by passing over the bolt but once; they never run backward, which obviates tearing the thread off the bolt or injuring the cutting edge of the dies.

3d. When the thread has been cut as far as desired, the dies are opened by moving the lever, and the bolt is withdrawn, while the machine still continues in motion as before. Another bolt may then be inserted, and the operation continued with much saving of time and labor.

4th. The dies can be removed in thirty seconds and those for another size substituted, without turning or loosening a bolt, screw or nut, and when the dies are placed in the head of a machine, it combines every advantage of a solid die and adjustable dies.

5th. Should the dies cut too large or too small, they may be adjusted in thirty seconds to any variation, from an eighth of an inch down to the hundredth part of an inch. By this means bolts can always be made to fit the nuts, no matter how much the taps may be worn.

6th. It will cut the usual V, square, or ratchet threads, with equal facility, and at one cut.

7th. It is provided with an "index," by the use of which the machine can be instantly adjusted to cut the required size, so that the bolts can be made to fit the nuts without the vexatious "cutting and trying" that is required on most machines.

8th. It is provided with means for tapping nuts when needed, and the change from cutting threads to tapping can be made in a minute, or vice versa.

9th. In the perfection of the thread produced it is surpassed by no other machine.

10th. In rapidity it surpasses all ordinary machines, its capacity being several times as great as that of the ordinary kind.

11th. It is so simple in construction that it is not liable to get out of order.

12th. Any apprentice, of ordinary intelligence, can adjust and operate it without the least difficulty.

No. 1.	Diameter of Bolt	$\frac{1}{4}$,	5-16,	$\frac{3}{8}$,	7-16,	$\frac{1}{2}$,	$\frac{5}{8}$,	$\frac{3}{4}$,
	Threads per inch,	20,	18,	16,	14,	13,	11,	10

Speed of Counter Shaft 125; diameter of pulley 12 inch, 3 inch face; weight complete, 600 lbs.

This machine is not geared, but has a cone of three pulleys, each 3 inches broad, giving ample power and variations of speed. Intended for doing light work very rapidly.

No. 2.	Diameter of Bolt,	$\frac{1}{2}$,	$\frac{5}{8}$,	$\frac{3}{4}$,	$\frac{7}{8}$,	1,	$1\frac{1}{8}$,	$1\frac{1}{4}$.
	Threads per inch,	13,	11,	10,	9,	8,	7,	7.

Speed of Counter Shaft 150; diameter of Pulley, 12 inches, 3 inch face; weight complete, 1,000 lbs.

This machine is intended for medium size work. Is very effective in railroad and general machine shops, general jobbing, etc., etc.

No. 3.	Diameter of Bolt,	1,	$1\frac{1}{8}$,	$1\frac{1}{4}$,	$1\frac{3}{8}$,	$1\frac{1}{2}$,	$1\frac{5}{8}$,	$1\frac{3}{4}$,	$1\frac{7}{8}$,	2,
	Threads per inch	8,	7,	7,	6,	6,	$5\frac{1}{2}$,	5,	5,	$4\frac{1}{2}$.

Speed of counter Shaft, 150; diameter of Pulley 18 inch, $4\frac{1}{2}$ inch face; weight about 2,000 lbs.

This machine is double-gearred, and is intended for heavy work, bridge bolts, etc.

No. 4.	Diameter of Bolt,	1,	$1\frac{1}{8}$,	$1\frac{1}{4}$,	$1\frac{3}{8}$,	$1\frac{1}{2}$,	$1\frac{5}{8}$,	$1\frac{3}{4}$,	2,	$2\frac{1}{4}$,	$2\frac{1}{2}$.
	Threads per inch,	8,	7,	7,	6,	6,	$5\frac{1}{2}$,	5,	5,	$4\frac{1}{2}$,	$4\frac{1}{2}$, 4.

Speed of Counter Shaft 75; diameter of Pulley 18 inches by $4\frac{1}{2}$ face; weight about 2,600 lbs.

This is a heavily double-gearred machine, so arranged as to give three speeds in gear, and three speeds from pulleys direct, with broad belt surfaces, thus fitting it for a large range of work from very large down to moderately small, and doing any size with celerity.

No. 5.	Diameter of Bolt,	1,	$1\frac{1}{8}$,	$1\frac{1}{4}$,	$1\frac{3}{8}$,	$1\frac{1}{2}$,	$1\frac{5}{8}$,	$1\frac{3}{4}$,	$1\frac{7}{8}$,	2,	$2\frac{1}{4}$,	$2\frac{1}{2}$,	$2\frac{3}{4}$,	3,
	Threads per inch,	8,	7,	7,	6,	6,	$5\frac{1}{2}$,	5,	5,	$4\frac{1}{2}$,	$4\frac{1}{2}$,	4,	4,	$3\frac{1}{2}$.

Speed of Counter Shaft 100; diam. of Pulley 18 inch by $4\frac{1}{2}$ inch face, weight about 2,800 lbs.

This machine is back-gearred like a lathe, has six speeds, and the holding vise has two screws geared together, so that it is capable of holding securely the heaviest work, or of tapping the heaviest nuts. It is intended for doing a very large range of work, from small to very heavy bolts.

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FOR PRICES SEE ACCOMPANYING LIST.

THE BURRELL NUT TAPPER.

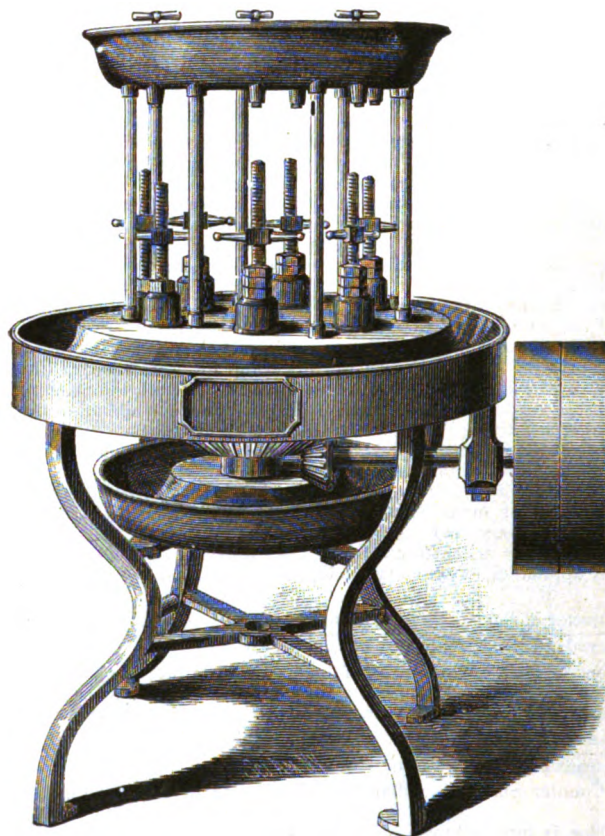


Fig. 1168.

The arrangement of these machines provides against any gumming, or obstructions in the sockets, resulting from chips, cutting or oil. The sockets for holding the taps are constructed that any tap will fit and work in or on any spindle, and the nuts when finished drop below the teeth of the tap, and, when full, the tap can be taken off and replaced without stopping the machine.

What we claim as advantages for these machines over any other arrangement for cutting nuts, is that with them nuts of the same or different sizes may be cut as rapidly as one man can put them on and take them off the taps; that the attendant can be kept busy and at the same time run at a speed sufficiently slow to preserve the life of the tap; the motion or speed of the taps is within the control of the operator and can be made fast or slow as desired; one or any number of the taps may be used as required.

SIZES.

Number.	Number of spindles.	Sizes tapped.	Weight.
1	7	1½ inches and less	900 lbs.
2	7	2 " "	1,050 "
3	3	2 " "	600 "

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FOR PRICES SEE ACCOMPANYING LIST.

LEWIS' PATENT BOLT POINTER.

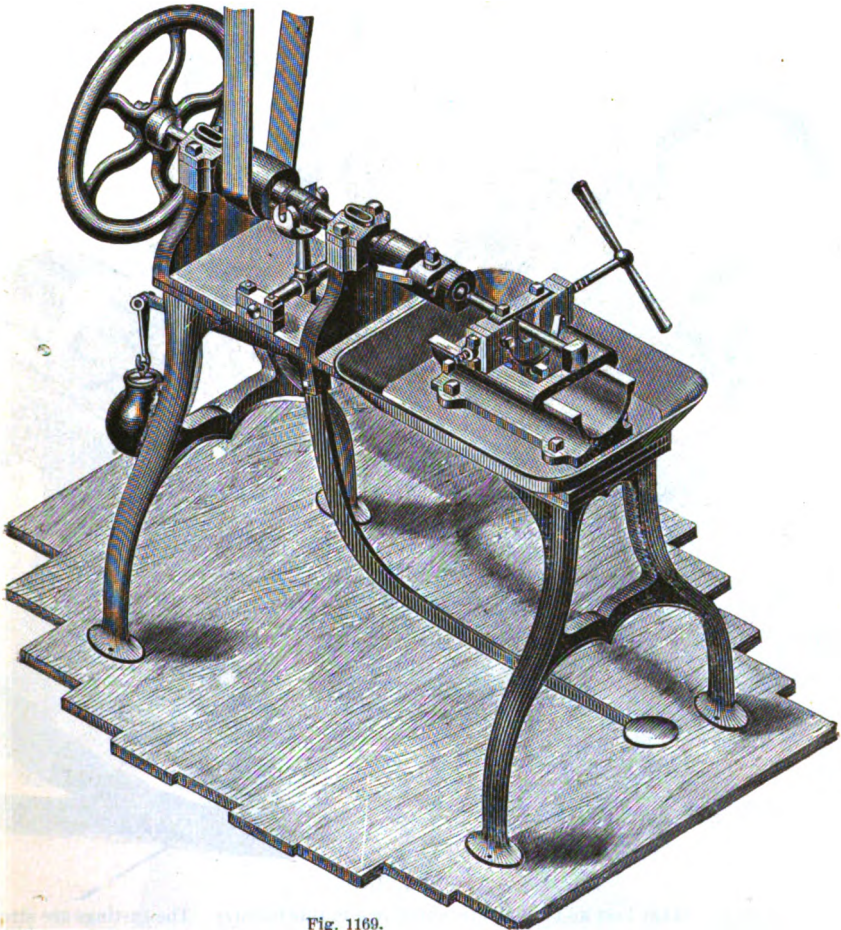


Fig. 1169.

This machine will point from 4,000 to 8,000 bolts per day. It has long knives with cutting edges on either end.

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FOR PRICES SEE ACCOMPANYING LIST.

LEWIS' PATENT BOLT HEADER.

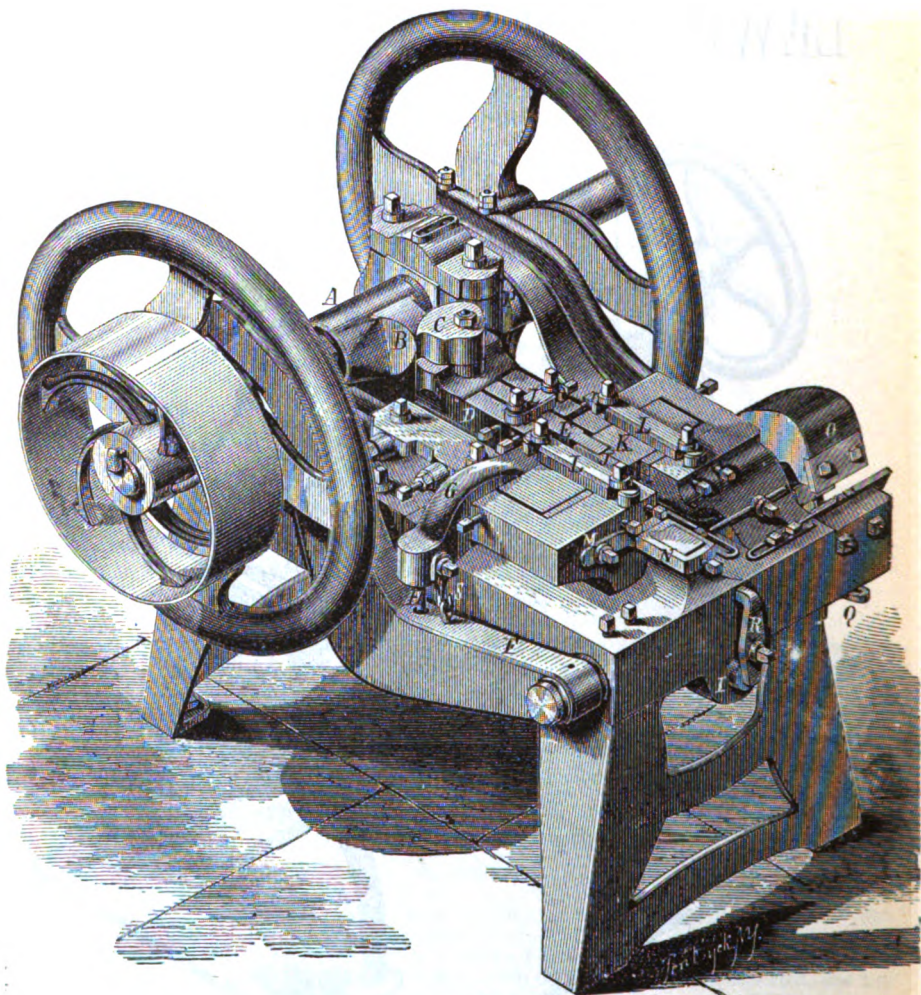


Fig. 1170.

The Header is the best and most substantial one in this country. The castings are strong and well fitted up with steel and brass, while the metal parts subjected to friction are chilled. The dies are made of excellent steel, and are so constructed and held that they can be dressed down a great many times. The machine can be run by either one or two persons, and is so simple that a boy can run it and keep it in order. It heads Iron from $\frac{1}{8}$ to $1\frac{1}{4}$ inches diameter. With one boy heating and one heading, it will in ten hours head:

5,000 to 6,000	Sq. Hd. Bolts,	$\frac{1}{2}$	inch diameter.
4,500 to 5,000	"	"	"
3,000 to 3,500	"	"	"
2,000 to 2,500	"	"	"
1,800	"	"	1 " "

and other sizes in proportion.

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FOR PRICES SEE ACCOMPANYING LIST.

LEWIS' PATENT BOLT HEADER—DESCRIPTION CONTINUED.

A change of Dies, occupying only five minutes, enables the operator to make either Square, Hexagon, T, Oval, Round, Countersunk, or, in fact, any shaped Head; and further, any length of Bolt can be made without changing the Dies. Rivets and Track Bolts are made from the rod at one stroke. From 7,000 to 10,000 Track Bolts can be made in a day.

A wrought-iron pin, standing between the lift and rocking levers, is the safeguard to the machine; for, if too large a Bolt is fed to the dies, this pin will bend before a casting breaks.

A man sent to start each Header sold. He instructs the purchaser's operator how to run it, and remains with it until it works to the satisfaction of the buyer.

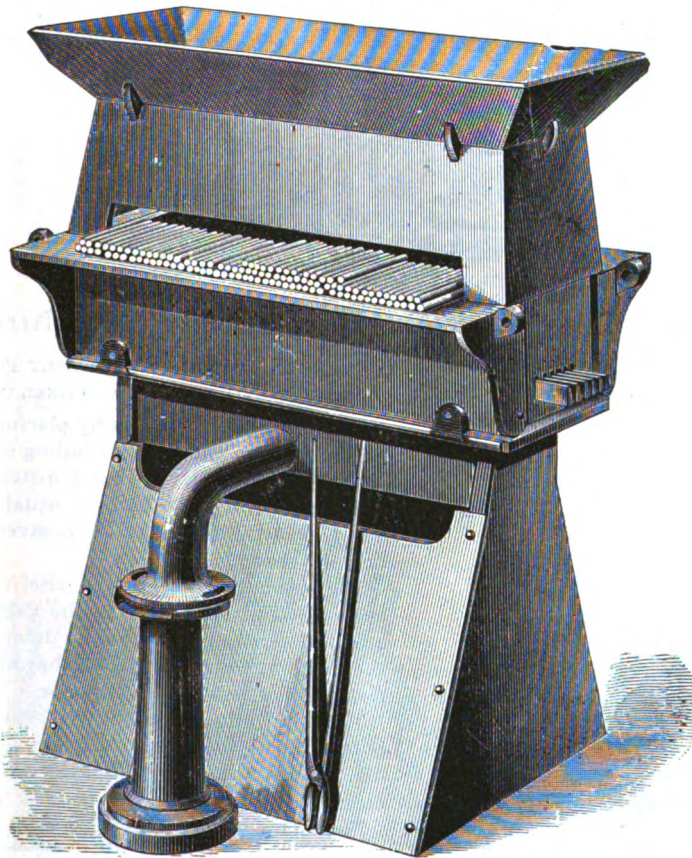
BOLT-HEATING FURNACE.

Fig. 1171.

Description and full particulars upon application.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

LIGHTNING TIRE SHRINKER.



Fig. 1172.

The tire being heated, is bent or kinked on the anvil, clamped in the machine by pressure of the foot, and hammered down to shape. A neat job can be made in this way, and it will be found the very best method for managing light tires, say two inches and under.

The Green River Horseshoer's Machine.

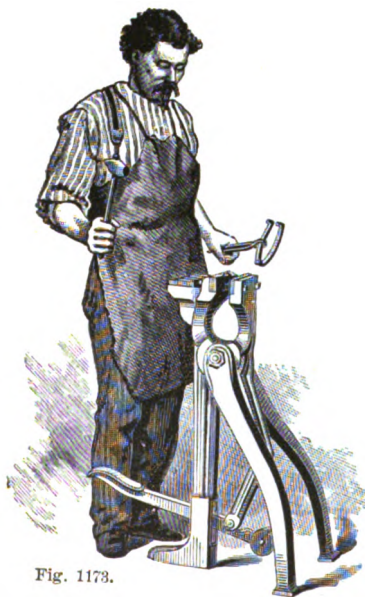


Fig. 1173.

A VISE AND STEEL DIES EXPRESSLY FOR WELDING AND SWAGING TOE AND HEEL CALKS.

The shoes being gripped by placing the foot on the treadle, and the vise falling open when the foot is taken off, work is dispatched in the most finished style in half the usual time, the anvil is saved, the hammer is saved, and no help is needed.

The dies in the jaws of the vise, so shaped as to give the right form to the calks as they are hammered, may be readily detached from the machine to be changed. They are so tempered as not to hurt the hammer.

The anvil attachment in front may be used in trueing up the shoe: it also carries the steel die, with four different sized slots for welding on calks.

The machine is entirely of steel and iron. It can be set anywhere. Will be found solid, simple and durable—a valuable labor-saving machine.

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FOR PRICES SEE ACCOMPANYING LIST.

GREEN RIVER TIRE BENDING MACHINE.

No. 3.

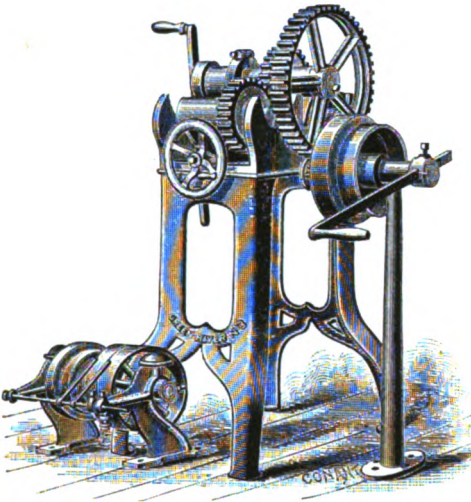


Fig. 1174.

For Light and Heavy Tires.

$\frac{3}{4}$ x 6 or 1 x 4 inches and smaller. Weight,
300 lbs.

For Hand and Power Use.

LIGHTNING PUNCHING PRESS.



Fig. 1175.

Will punch $\frac{1}{4}$ inch hole in $\frac{1}{4}$ inch iron.

With three punches and dies, $\frac{1}{8}$, $\frac{3}{16}$, and $\frac{1}{4}$ inch. Unless otherwise ordered Punches and Dies will be supplied $\frac{1}{8}$ inch over exact sizes.

The handle may be set at any angle, up or down, to suit various kinds of work.

This machine is carefully made throughout of the best material and is highly approved by our customers.

ROUND IRON SHEAR.

No. 9.

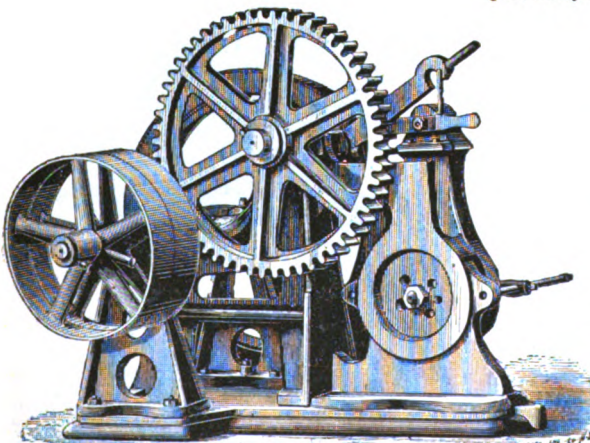


Fig. 1176.

This machine, which is a power attachment to our hand shear for round iron, occupies a floor space 36x36 in., and weighs about 1,200 pounds.

Will cut $1\frac{1}{8}$ in. and smaller sizes of iron.

22 CORTLANDT STREET, NEW YORK
FOR PRICES SEE ACCOMPANYING LIST.

Lyon's Hand Punches and Shears.

PUNCH.

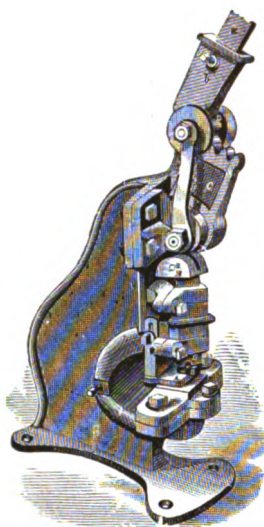


Fig. 1178

FLAT BAR-IRON SHEAR.

No.	Diameter of hole.	Thickness of iron.	Distance from edge.	Weight.
1,	$\frac{1}{4}$ inch.	$\frac{1}{8}$ inch.	24 inches.	33 lbs.
2,	$\frac{1}{2}$ "	$\frac{1}{4}$ "	34 "	65 "
3,	$\frac{3}{4}$ "	$\frac{3}{8}$ "	32 "	115 "
4,	1 "	$\frac{1}{2}$ "	4 "	360 "
5,	1 1/2 "	$\frac{3}{4}$ "	7 1/2 "	590 "

SHEAR.

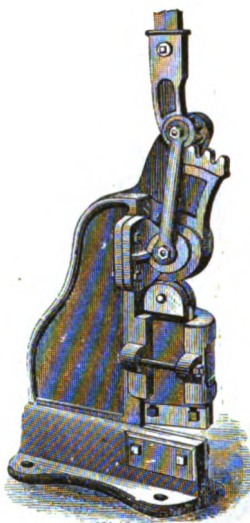


Fig. 1179.

ROUND IRON SHEAR.

No.	Thickness of iron.	Weight.
1,	$\frac{1}{8}$ inch.	115 lbs.
2,	$\frac{1}{4}$ "	210 "
3,	$\frac{3}{8}$ "	275 "
4,	$\frac{1}{2}$ "	475 "

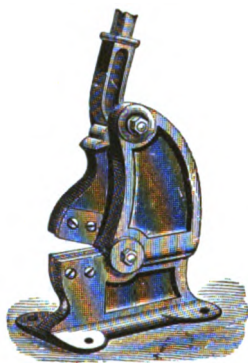


Fig. 1180.

No.	Sizes of bar cut.
0,	$\frac{1}{8}$ x $\frac{3}{4}$ inch.
1,	$\frac{1}{4}$ x $1\frac{1}{4}$ inches.
2,	$\frac{3}{8}$ x $1\frac{3}{4}$ "
3,	$\frac{1}{2}$ x 2 "
4,	$\frac{3}{4}$ x 2 "



Fig. 1181.

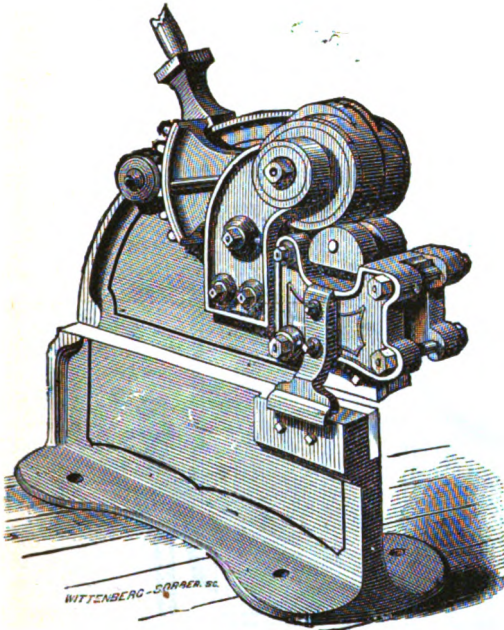
No.	Sizes cut.
0,	0 to $\frac{1}{4}$ inch.
1,	$\frac{1}{8}$, $\frac{1}{4}$ and $\frac{1}{2}$ inch.
2,	$\frac{3}{8}$, $\frac{1}{2}$ " $\frac{3}{8}$ "
3,	$\frac{1}{2}$, $\frac{3}{4}$ " $\frac{1}{2}$ "
4,	$\frac{3}{4}$, $\frac{1}{2}$ " $\frac{3}{4}$ "
5,	$\frac{1}{2}$, $\frac{3}{4}$ " $\frac{1}{2}$ "
6,	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ " $\frac{3}{8}$ "
7,	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 "
8,	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, 1 " $1\frac{1}{8}$ "

These Shears made to order for cutting Square Iron.

22 CORTLANDT STREET, NEW YORK.

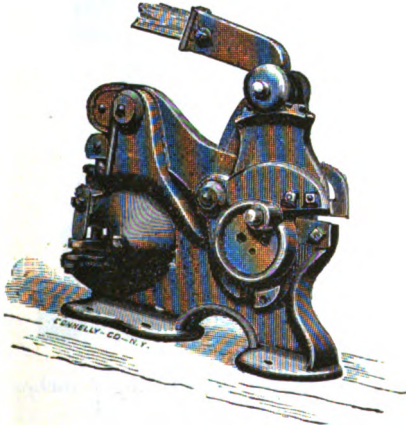
FOR PRICES SEE ACCOMPANYING LIST.

Hand Plate Shear No. 5.
WITH LEVER ON THE BACK.—Fig. 1182.



To cut $\frac{1}{8}$ in. plate. Weight 750 lbs.

Combined Hand Punch and Shears.—Fig. 1184.



SIZES.

No.	To Cut. Round. Flat.	To Punch. Hoop Iron.	Weight.
0	$\frac{1}{8}$ in.		
2	$\frac{1}{4}$ in. $\frac{1}{2} \times 1\frac{1}{2}$ in.	$\frac{1}{2} \times 3\frac{1}{2}$ in. from edge.	200 lbs.
3	$\frac{3}{8}$ in. $\frac{3}{8} \times 3\frac{1}{2}$ in.	$\frac{3}{8} \times 4$ in. "	450 "

HAND
OR
POWER SHEAR.

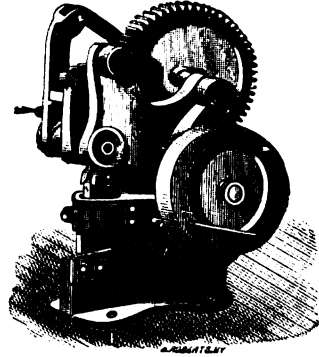


Fig. 1183.

SIZES.

No.	Thickness of plate.	Weight.
3	$\frac{1}{2}$	575 lbs.
4	$\frac{1}{4}$	900 "

HAND
OR
Power Punch.

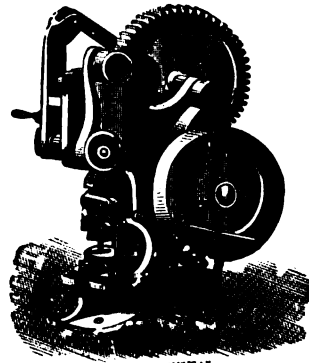


Fig. 1185.

SIZES.

No.	Diam. of hole.	Thickness of Plate.	Weight.
4	$\frac{1}{2}$ in. 4 from edge	$\frac{1}{8}$	750 lbs.
5	$\frac{3}{4}$ " 7 $\frac{1}{2}$ " "	$\frac{1}{4}$	1,150 "

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HAND SHEARS.

TAFT'S PATENT IMPROVED.

These shears excel all others for ease in working, durability and simplicity.
They will cut up sheets of any width or length.

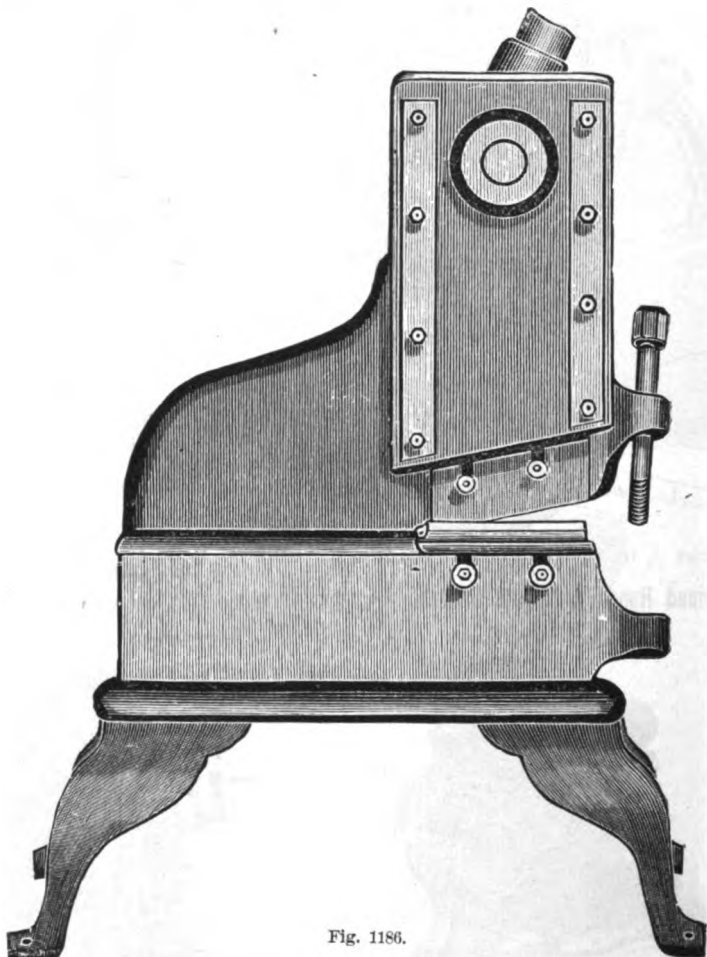


Fig. 1186.

SIZES.

No.	Cuts,	$\frac{1}{8}$ inch Plate,	Iron Blades	3 inches long.
No. 1.....	"	$\frac{1}{8}$	"	4
No. 2.....	"	$\frac{1}{8}$	"	5 $\frac{1}{2}$
No. 3.....	"	$\frac{1}{8}$	"	7 $\frac{1}{2}$
No. 4.....	"	$\frac{1}{8}$	"	8 $\frac{1}{2}$
No. 5.....	"	$\frac{1}{8}$	"	9 $\frac{1}{2}$
No. 6.....	"	$\frac{1}{8}$	"	10
No. 7.....	"	$\frac{1}{8}$	"	
No. 8.....	"	$\frac{1}{8}$	"	

Lever works on either front or back side.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HAND PUNCHES.

[TAFT'S IMPROVED.]

These tools excel all others made, for Ease of Working, Durability and Simplicity.

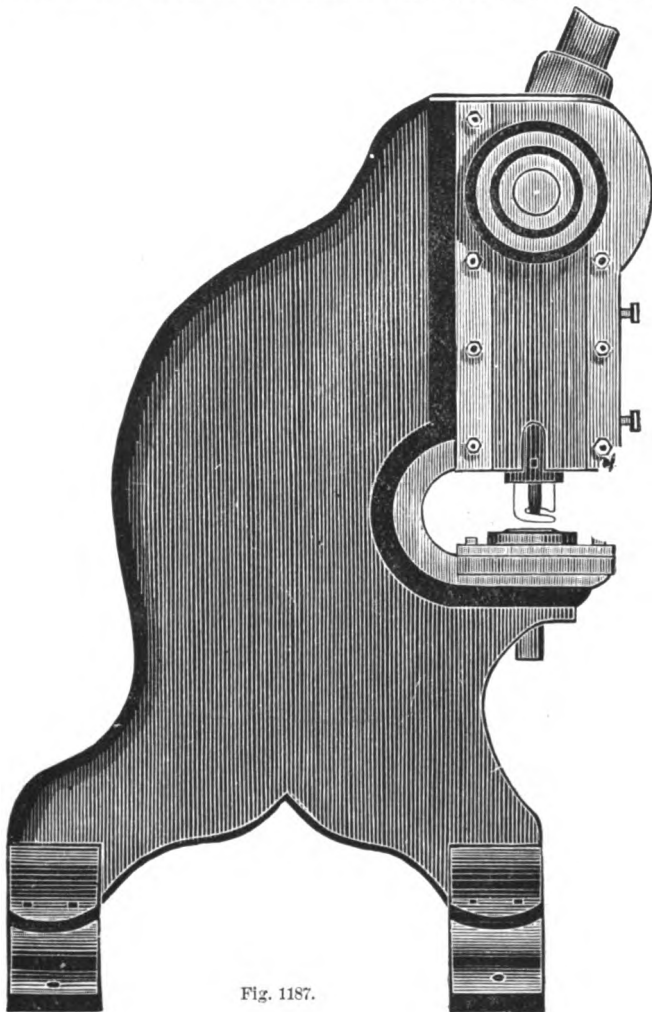


Fig. 1187.

SIZES.

No. 1.....	Punches 1-8 inch hole, in 1-8 inch Plate Iron.
No. 2.....	" 3-16 " in 3-16 " " "
No. 3.....	" 1-4 " in 1-4 " " "
No. 4.....	" 5-16 " in 5-16 " " "
No. 5.....	" 3-8 " in 3-8 " " "
No. 6.....	" 7-16 " in 7-16 " " "
No. 7.....	" 1-2 " in 1-2 " " "
No. 8.....	" 9-16 " in 9-16 " " "

Lever Works on Front and Back side.

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FOR PRICES SEE ACCOMPANYING LIST.

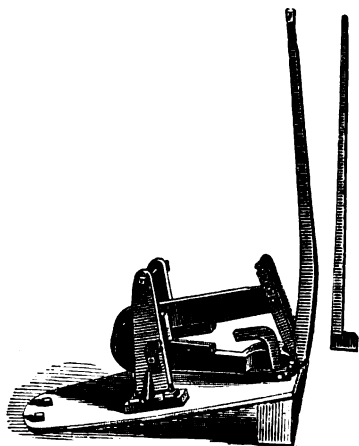


Fig. 1188.

Hand Shear for Bar Iron.

No.	Weight.	Cuts			
1.	62 lbs.	$\frac{3}{8} \times 2$ or $\frac{1}{4}$ in.	Round or Square	Iron.	
2.	165 lbs.	$\frac{1}{2} \times 2$ or $\frac{3}{4}$ in.	"	"	"
3.	357 lbs.	$\frac{3}{4} \times 4$ or 1. in	"	"	"

No. 4 PEERLESS SHEAR.

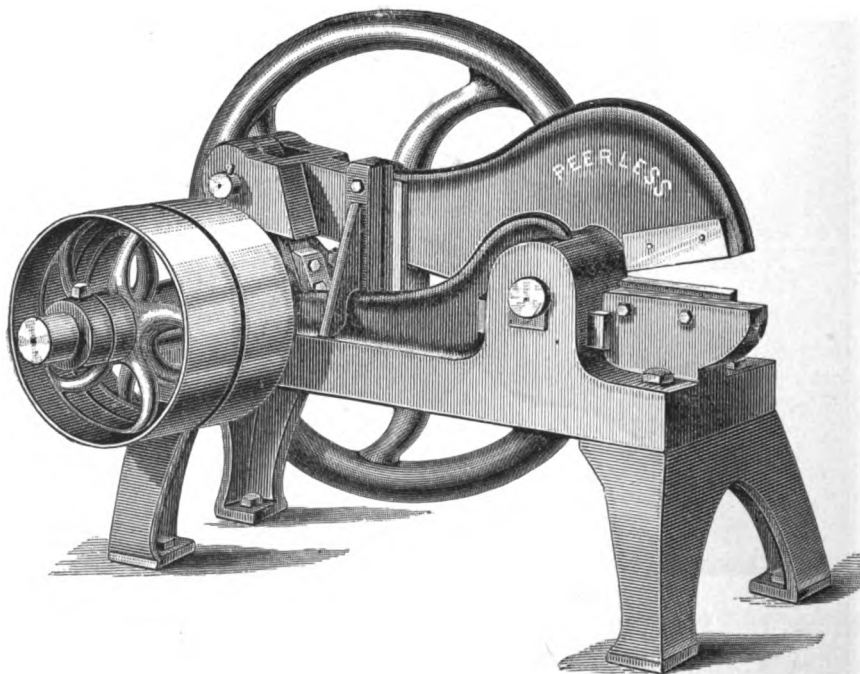


Fig. 1189.

No. 4 will cut $6 \times \frac{1}{2}$ inches, $2 \frac{1}{2} \times \frac{3}{4}$ inches flat bar iron, and $1 \frac{1}{4}$ inches round, cold. Weight, 2,500 pounds. Pulleys, 30×6 inches. Fly-wheel weighs 710 pounds; diameter, 4 feet. The machine occupies floor-space 29×58 inches.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

RILEY'S FOOT PRESS.

FOR EVERY DESCRIPTION OF SHEET METAL
STAMPING.

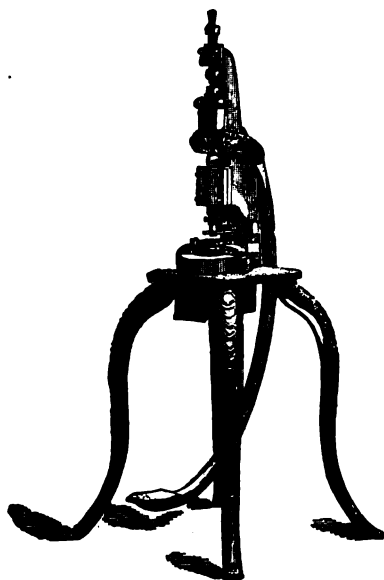


Fig. 1190.

No. 1.—This press has a larger range of adjustment and longer stroke than any other press in the market. The treadle starts from the same point if desired, if the stroke is short or long. The stroke of press is $1\frac{1}{2}$ inches, and space under plunger to bed is 6 inches; length of bottom bearing $4\frac{1}{2}$ inches; length of top bearing $2\frac{1}{2}$ inches; length of plunger is 23 inches. By having the bearings of the press located as they are, lost motion, which would be ruinous to the tools on some presses, is entirely avoided. We have also fitted with each press an iron drawer, to receive the work. The greatest care is exercised in the material and workmanship.

Opening in Bed $3\frac{1}{4}$ inches. Stroke of Plunger $1\frac{1}{2}$ inches. Weight on legs 300 pounds. Also furnished without Legs or Drawer for Bench purposes.

No. 2.—We also make a larger size suitable for any kind of work, weight 500 pounds.

Peerless Power Press.

No. 2.—Weight, complete, 550 lbs.; balance-wheel, $20 \times 3\frac{1}{2}$ inches, weighing 140 lbs.; distance back from centre of slide, 5 inches; opening in bed, 8×5 inches; distance from bed to bottom of slide, when up, $5\frac{3}{8}$ inches; has long, wide bearings. The press is 4 feet 8 inches in height, and occupies floor space 26×28 inches.

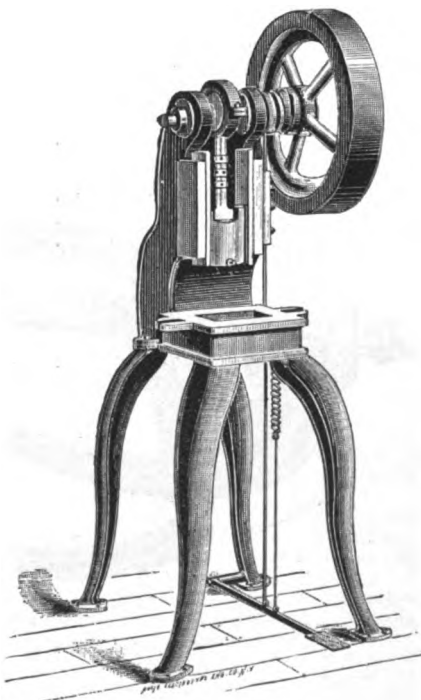


Fig. 1191.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

HAND SCREW PRESS.

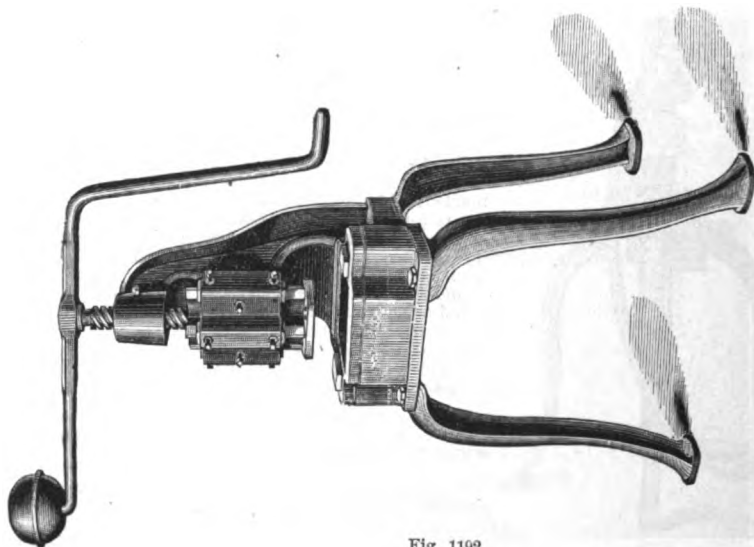


Fig. 1192

No.	Opening in bed.	Bed to bottom of slide.	Distance back from centre of slide.	Weight.
1,	5 x 5 in.	5 1/4 in.	4 1/4 in.	325 lbs.
2,	8 x 8 in.	8 in.	6 1/4 in.	725 lbs.
3,	15 x 16 in.	8 in.	12 in.	1050 lbs.

Brass Founders' Gate-Shear.

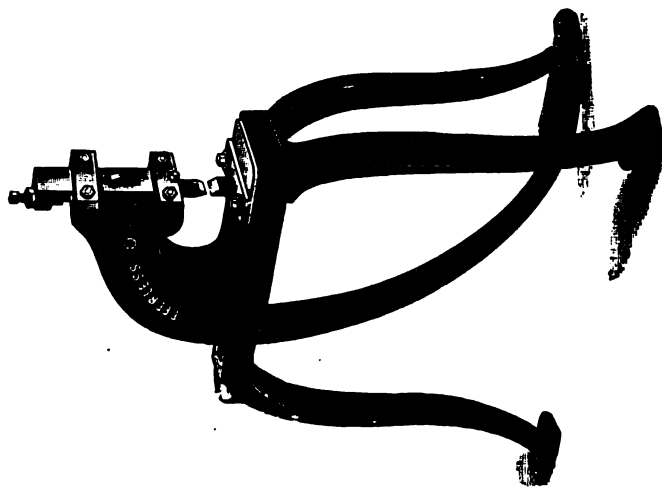


Fig. 1193.

PERLESS No. 1 FOOT SCREW-SHEAR, for cutting off GATES from brass and other soft castings, by foot power, quickly and closely (in place of chisel or saw). Can be operated by a boy. Throat is 5 1/2 inches behind knives, and 6 inches in height—giving plenty of space for large pieces. Weight 250 pounds. Occupies floor space only 20 x 36 inches. Cuts 1/2 in. thickness.

No. 2 SIZE, weighs 400 pounds; throat 7 inches behind knives, and 7 1/4 inches in height inside; occupies floor space 24 x 38 inches; stands on four heavy legs.

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FOR PRICES SEE ACCOMPANYING LIST.

BAR IRON SHEAR.

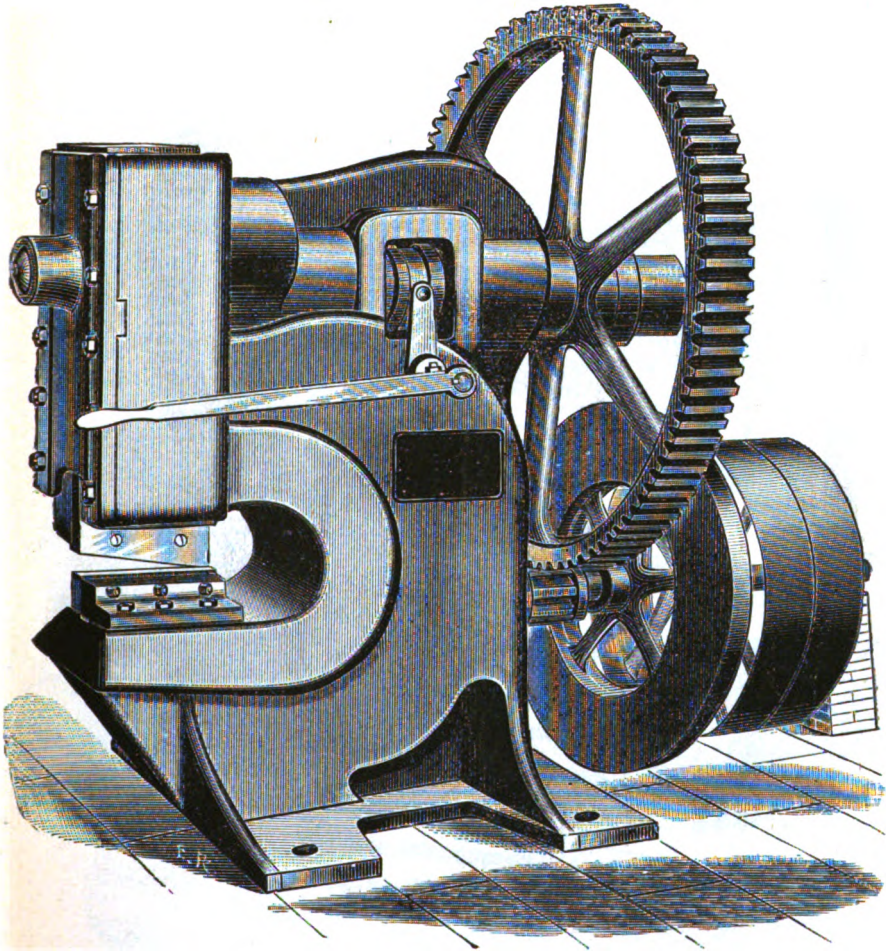


Fig. 1194.

This cut is the design and style of all sizes. It shows knives for flat iron in place. Each machine is supplied with one set of knives. Duplicates, or knives of other shapes, for round or angle iron, will be charged for extra.

These machines will cut flat, round or angle iron, and are made with a clutch for stopping and starting the cutter while the fly-wheel and gearing are in motion. A bar of iron can thus be cut accurately to the mark. We put a gauge on the machine, for cutting any number of pieces of uniform length.

This is a most serviceable tool for Locomotive Builders, Bolt-makers, Bridge-builders, Bar Iron Rolling Mills, or for cutting Puddle-bars in Sheet Mills. A tight and loose pulley is on the machine, so that a countershaft is not required.

SIZES.

Number	1	2	3	4
Size of flat iron cut, inches	4 x $\frac{1}{4}$	6 x 1	8 x $1\frac{1}{2}$	10 x 2

22 CORTLANDT STREET. NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

TRIMMING SHEAR.

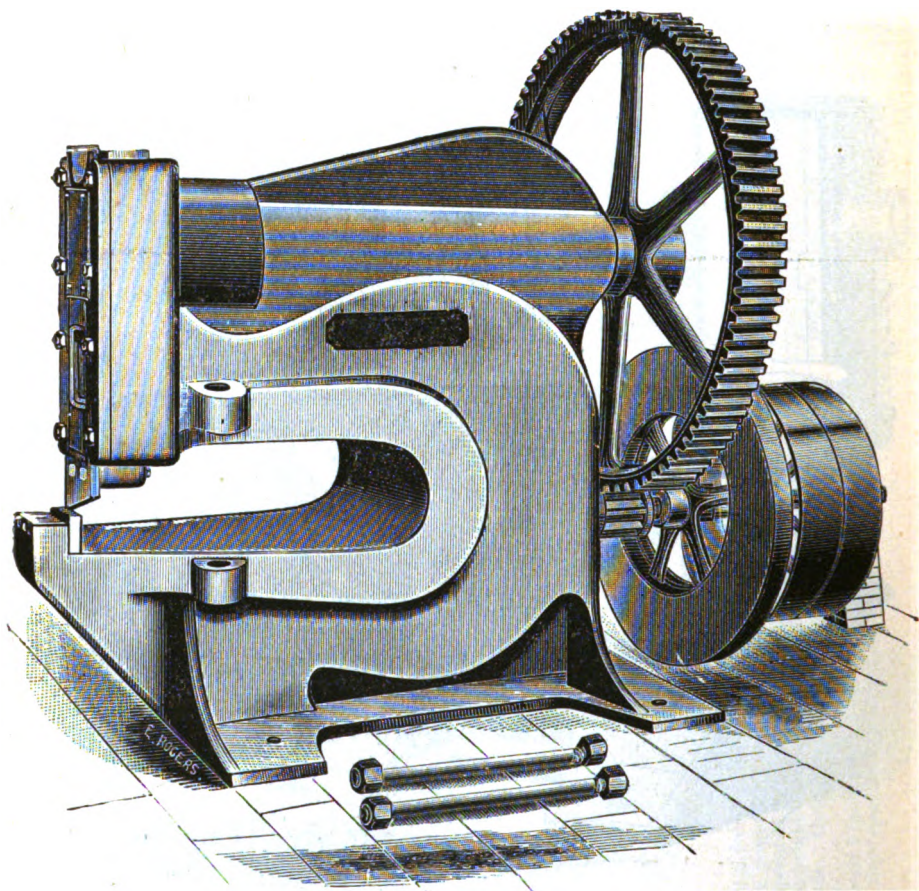


Fig. 1195.

This cut shows the general design and style of all sizes. This tool is well adapted to Boiler Shops, Iron Ship Yards, and Sheet or Plate Iron Work in general.

SIZES

Number,	0	1	2	3	4
Thickness of iron sheared,	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1 inch.
Distance from edge, "	16	20	25	30	40 "

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FOR PRICES SEE ACCOMPANYING LIST.

COMBINED PUNCH AND BAR IRON SHEAR.

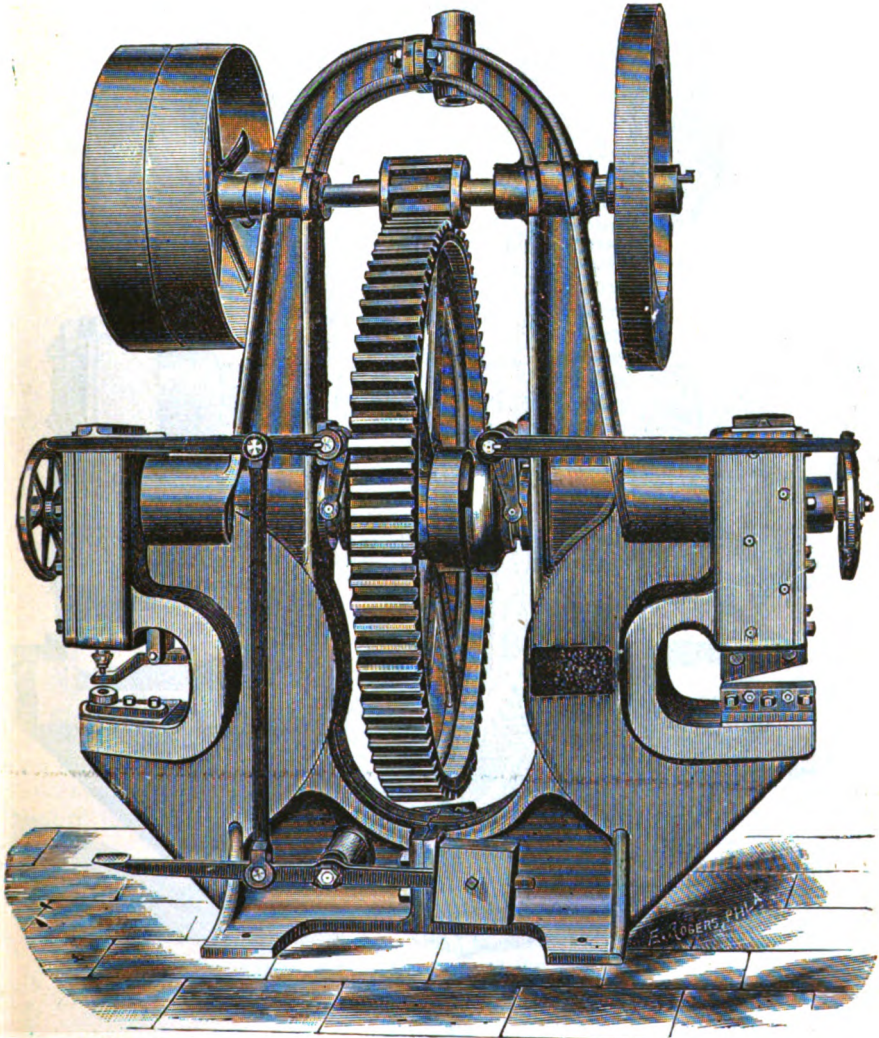


Fig. 1196.

For description and List of sizes see page 415.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

COMBINED PUNCH AND SHEAR.

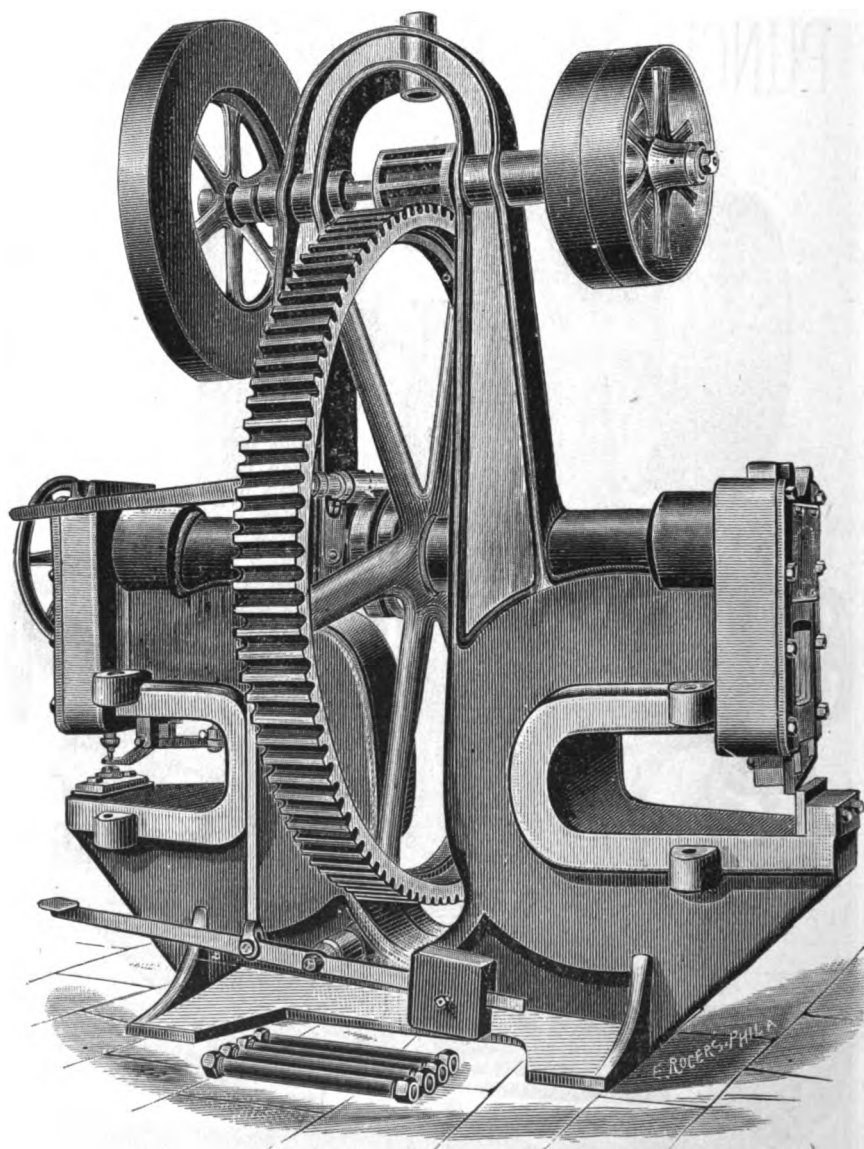


Fig. 1197.

For description and list of sizes see page 415.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

COMBINED PUNCH AND BAR IRON SHEAR.

Fig. 1196.

DESCRIPTION.

Fig. 1196 shows the design and style of all sizes. The die-seat is very conveniently arranged, and the stripper is adjustable to suit different thicknesses of iron. The Punch and the Shear are worked by clutches and are entirely independent of each other. Where great accuracy is required, the hand-wheel is intended to be used to place the Punch or the Shear on the mark before throwing in the clutch. In this way work can be punched as true as drilling. A small engine can be attached instead of the belt pulleys, at special rates.

SIZES:

No.	Diameter of Hole Punched.	Thickness of Iron Punched.	Size of Flat Iron Sheared.	Size of Round Iron Sheared.
0,	1 inch.	$\frac{1}{2}$ inch.	$3 \times \frac{3}{4}$ inches.	$1 \frac{1}{4}$ inches.
1,	1 "	$\frac{3}{4}$ "	4 X 1 "	$1 \frac{3}{4}$ "
2,	$1 \frac{1}{4}$ "	1 "	$5 \times 1 \frac{1}{4}$ "	$2 \frac{1}{4}$ "
3,	$1 \frac{1}{2}$ "	$1 \frac{1}{4}$ "	$6 \times 1 \frac{1}{2}$ "	$2 \frac{1}{2}$ "

Combined Punch and Shear.

Fig. 1197.

Fig. 1197 is the design of all sizes that are driven by belt power. When desired we place a small engine on the machine, the crank of which goes on where the pulleys are now shown. The Shear runs at all times when the belt is on the tight pulley, but the Punch end can be stopped and started by a clutch, and for very particular work the hand wheel is used to set the Punch to mark before throwing in the clutch. The stripper is adjustable to different kinds of iron.

SIZES:

No.	Diameter of Hole Punched.	Thickness of Iron Punched and Sheared.		Distance from Edge Punched.
0,	$\frac{3}{4}$ inch.	$\frac{3}{8}$	$\frac{3}{8}$ inch.	16 inches.
1,	$\frac{3}{4}$ "	$\frac{1}{2}$	$\frac{1}{2}$ "	20 "
2,	1 "	$\frac{3}{4}$	$\frac{3}{4}$ "	20 "
3,	$1 \frac{1}{4}$ "	1	$\frac{7}{8}$ "	25 "
4,	$1 \frac{1}{2}$ "	$1 \frac{1}{4}$	$1 \frac{1}{8}$ "	25 "

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FOR PRICES SEE ACCOMPANYING LIST.

BOILER IRON PUNCH.

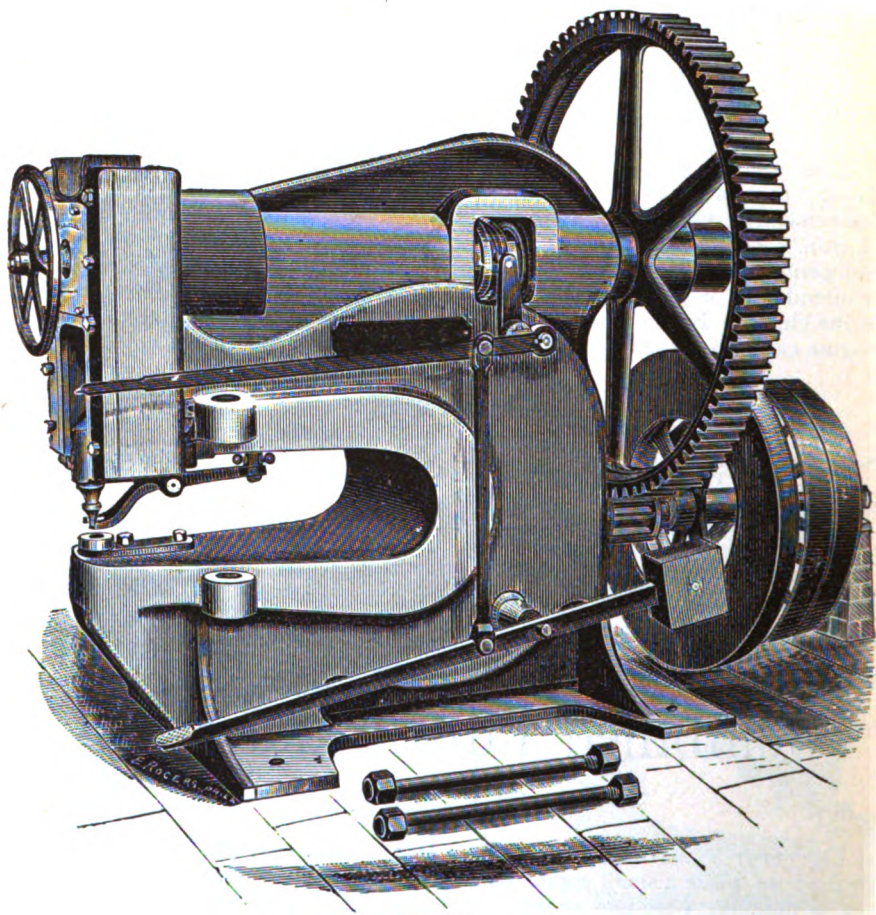


Fig. 1198.

This cut shows the general design and style of all sizes. The die seat is very conveniently arranged, and the stripper is adjustable to suit different thicknesses of iron.

The clutch is on the outside of the spur wheel, and is moved by a rod passing through a hole in the centre of the shaft and connected with a sliding sleeve worked by the hand or foot lever. Where great accuracy is required, the hand wheel is intended to be used to place the punch before throwing in the clutch.

SIZES:

No.	Size of Hole Punched.	Thickness of Iron Punched.	Distance from Edge.
0,	$\frac{3}{8}$ inch.	$\frac{3}{8}$ inch.	16 inches.
1,	$\frac{3}{4}$ "	$\frac{1}{2}$ "	20 "
2,	1 "	$\frac{3}{4}$ "	25 "
3,	$1\frac{1}{4}$ "	1 "	30 "
4,	$1\frac{1}{2}$ "	$1\frac{1}{4}$ "	40 "

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FOR PRICES SEE ACCOMPANYING LIST.

BOILER PLATE PLANER.

COOKE & CO.

417

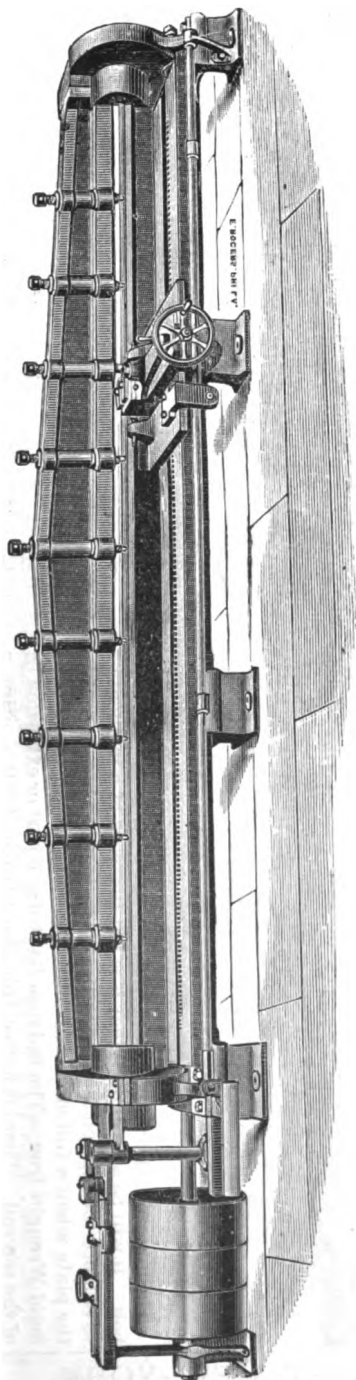


Fig. 1192.

NOTICE THE FOLLOWING GREAT ADVANTAGES THIS MACHINE HAS OVER ALL OTHERS :

First. It will plane 13 feet 10 inches long at one setting, and by resetting or moving the plate endwise will plane any length of plate.

Second. There are two separate tools on the tool post, and they are arranged on the saddle for easy and independent adjustment, and the cut is taken both ways on the plate ; the hand-wheel shown feeds both tools at the same time.

Third. The machine is so designed that the large table holds the plate and at the same time answers for a gauge for quickly setting the edge of the plate, so that no time is lost in measuring with a rule. The nine screws in the cross-bridge are for straightening and taking the buckles out of the edge of the plate, and at the same time they assist in holding it securely while being planed.

Fourth. The large steel screw that moves the saddle is supported its entire length, lying in a groove that keeps it always well oiled and prevents it from being sprung or bent. The belt shifting arrangement is such that a very short movement of the saddle is obtained when desired.

Notice.—We will guarantee that this machine will do as much work in one hour as the best boiler-maker will chip in twelve hours, and the machine will do it correctly, while the boiler-maker will do it irregularly and in a great measure cut or score the adjoining sheet, thus weakening it.

22 CORTLANDT STREET, NEW YORK.

PATENT PLATE BENDING ROLLS.

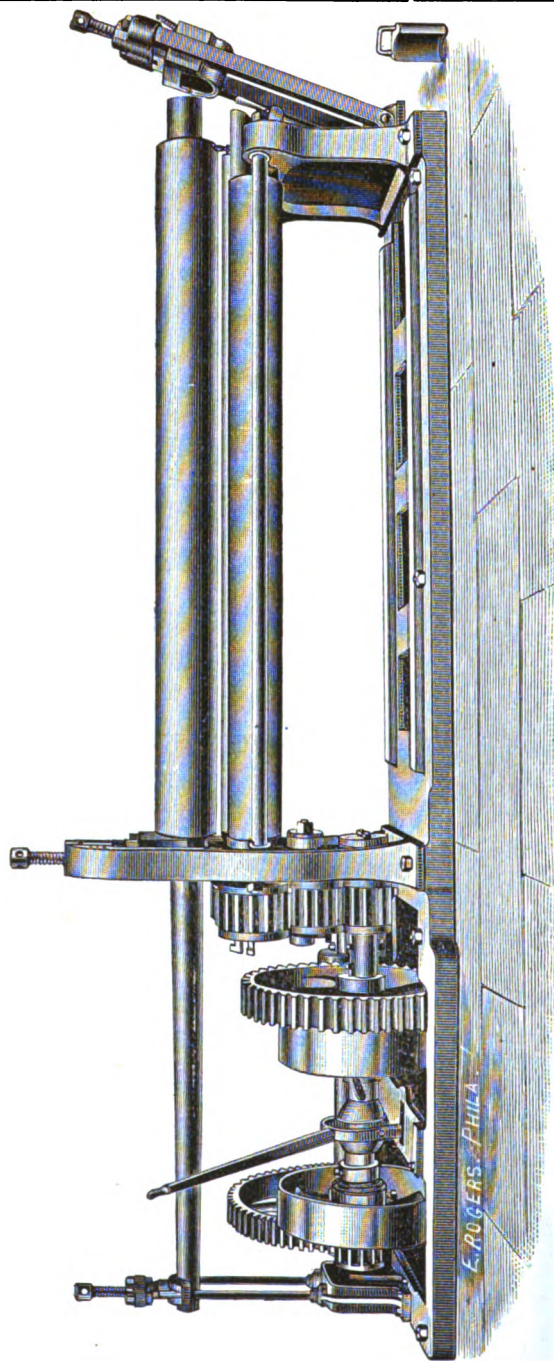


Fig. 1200.

DESCRIPTION.

The annexed cut represents all sizes we make to be driven by belt. It will be seen at once that it is but the work of a moment to balance the top roll and lower the hinge housing to take out the plate when a full circle is bent. The rolls are all made of Solid Wrought Iron. The Balance Bar being a part or extension of the top roll. There is a Cast Iron Bed-Plate under the entire machine. To save any shifting of belts we put in Friction Pulleys, which enable the rolls to be started, stopped, or reversed instantly.

SIZES:

No.	Top.	Diameter of Rolls.	Bottom.	Distance between Housings.
0,	6	inches.	5½ inches.	6 feet.
1,	7½	"	6½ "	7 "
2,	8¾	"	8 "	8½ "
3,	10½	"	9 "	10½ "
4,	12	"	10½ "	12 "
5, 11, 13	13	"	11½ "	12 "

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HORIZONTAL CRANK-PIN PRESS.

As used for forcing Crank-Pins into locomotive driving-wheels without removing the wheels; for pushing Crank-Pins into cranks when on the shaft; for taking off and forcing on locomotive and car-wheels, etc.

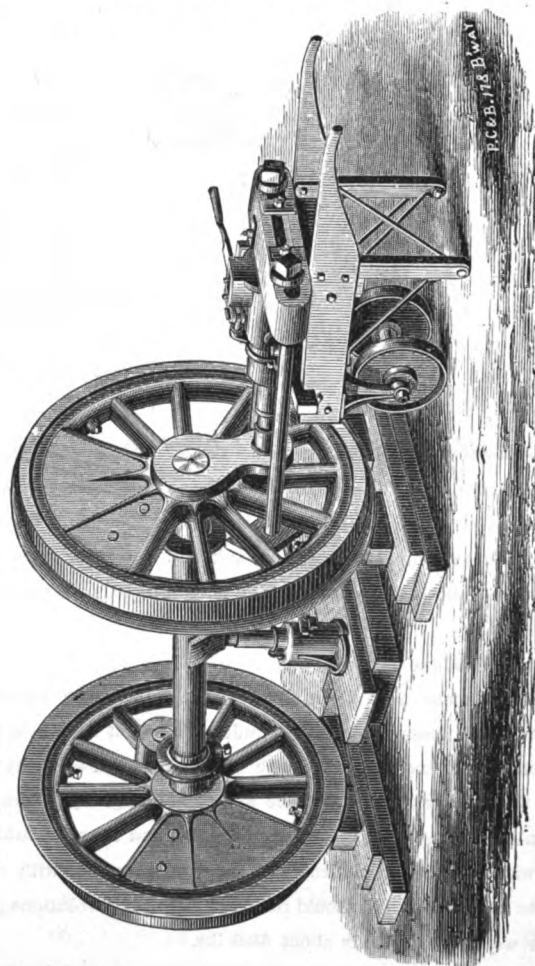


Fig. 1201.

These presses have our improved Horizontal Jack.

The valves are large, and the lever is worked perpendicularly by the operator, and not by pushing on the lever, thus adding fifty per cent. to their power and ease of operation.

SIZES.

60 ton Press with truck and cross-bar.

90 ton Press with truck and cross-bar.

120 ton Press with truck and cross-bar.

Rods made to order, extra.

22, CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Car Wheel Press for 48 Inch Wheel, with Single Plunger Pump.

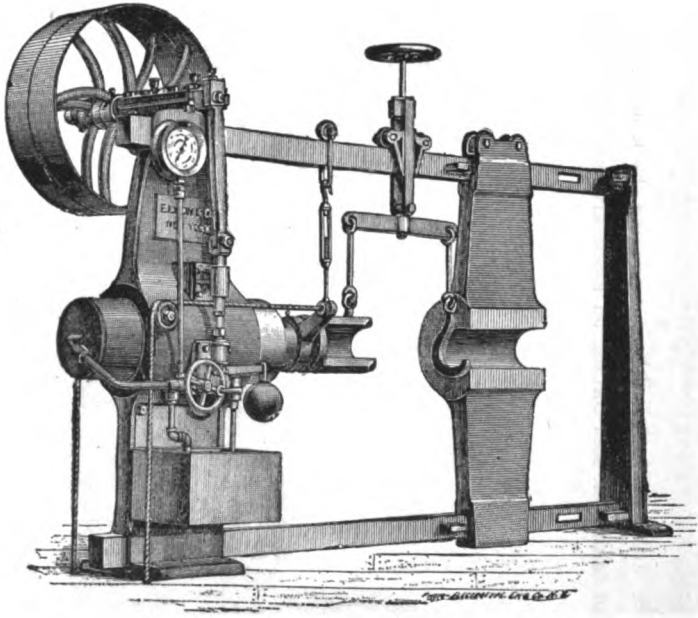


Fig. 1308.

This Improved Press has a steel cylinder with six and one half inch ram running out eighteen inches, and is capable of exerting a pressure of one hundred tons. The valves are of easy access. The crank shaft is steel, and large in diameter, and runs in babbitted boxes. The pressure gauge, water tank and returning weights are furnished with each press. The pulleys are 30 inches in diameter, and should run from 80 to 100 revolutions per minute.

The weight is about 5000 lbs.

We also make a 42 INCH CAR WHEEL PRESS, with single or double plunger pump. This Improved Press has a steel cylinder with eight inch ram running out eighteen inches, and is capable of exerting a pressure of one hundred and fifty tons. The pump is double-acting, the valves easy of access, the abutment hangs by rollers from the upper tension bar, the crank shaft is steel and large in diameter, and runs in babbitted boxes. The pressure gauge, water tanks and returning weights are furnished with each press. The pulleys are 30 inches in diameter, and should run from 80 to 100 revolutions per minute.

The weight complete is about 6500 lbs.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

"EUREKA" STEAM HAMMERS.

Single Frame.

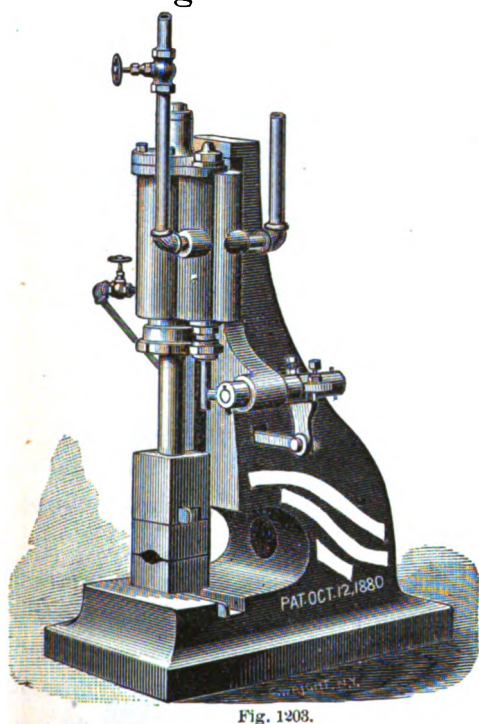


Fig. 1203.

Without Frame.

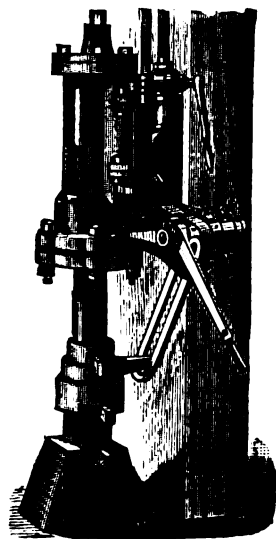


Fig. 1204.

The Eureka Hammers are adapted to all kinds of general and special forging work. They are made of the very best material. The Piston and Rod are of steel. The die head is also of steel. We make the rod square, which enables us to pack it better and with less friction than is possible with any other shape.

SIZES.

Double Frame No. 7, 7 in. bore x 18 in. stroke.

	WITHOUT FRAME.			SINGLE FRAME.		
No.	1	2	3	4	5	6.
Bore, inches	5	5½	6¾	3½	5	6.
Stroke "	12	16	24	7	12	16.

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FOR PRICES SEE ACCOMPANYING LIST.

ALLEN'S Pneumatic Riveting Machine.

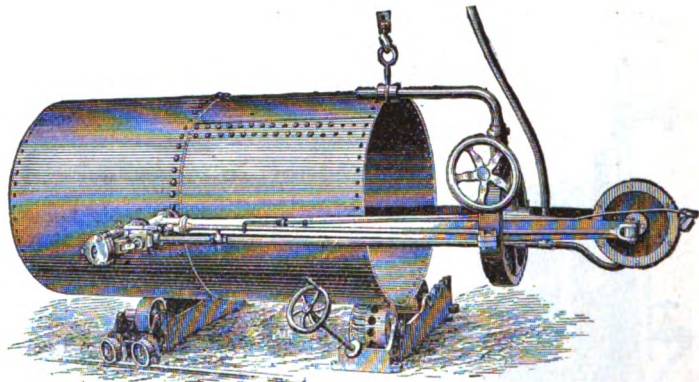


Fig. 1205.

The advantages of this Riveting Machine are :—

First.—The facility of taking the machine to the work to be operated upon, instead of *carrying the work to the machine*, as is required with all other riveting machines heretofore made. The machine, with levers, etc. complete, weighs about 760 pounds.

Second.—The great saving of labor and expense, as by riveting by hand, *one* holder-on and *two* riveters are required, while by the use of this machine only *one* man (who need not be a skilled riveter) will be necessary.

Third.—*Rapidity* of work. Nearly all boiler makers agree that to drive 35 pounds, or about 250 rivets, is considered a good day's work for *one* holder-on and *two* riveters, while by the employment of this machine, *one* man can drive from 750 to 800 rivets a day, allowing for all necessary detention.

Fourth.—The machine requires absolutely *no* preparation of foundation or other accompaniments, and is furnished at a price much below the cost of producing any existing machine.

This Riveting Machine has been in practical operation since 1878, and we have received many very flattering testimonials from the firms using them.

Fig. 1205 represents the Riveter as operating on the side of a boiler shell; but the same being supported in a *turning ring* is equally applicable to operate on the top or at any angle to the shell.

Full particulars and prices on application.

22 CORTLANDT STREET, NEW YORK
FOR PRICES SEE ACCOMPANYING LIST.

LOUISVILLE BALING PRESS.

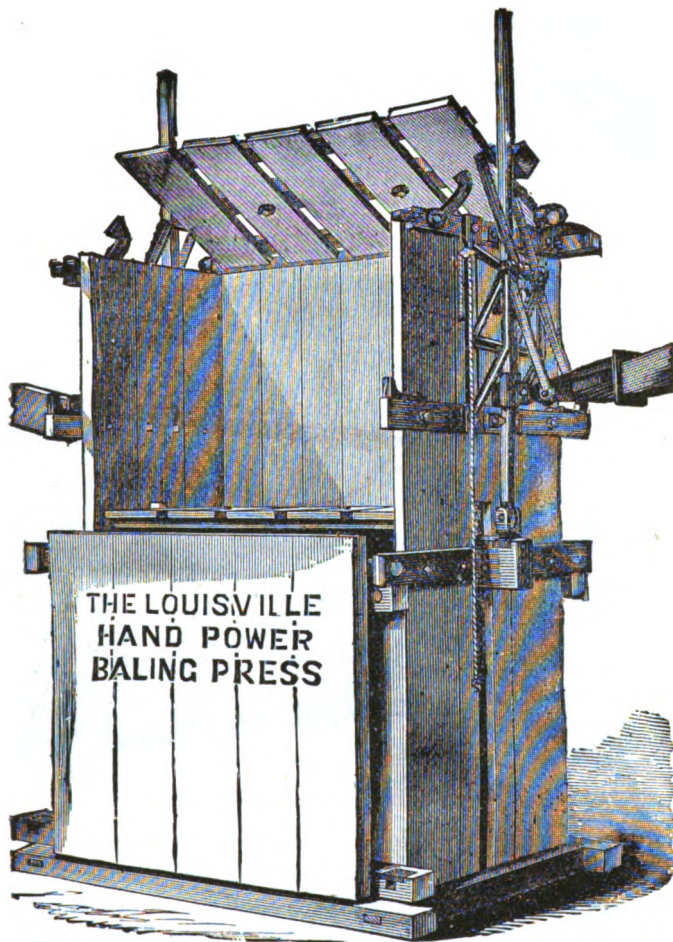


Fig. 1206.

We commenced building this Press in 1856, and are still building them for the trade. We make all the irons extra heavy and strong for the work required, and to suit the labor of the South.

These Presses are admirably adapted for hemp, rags, hair, hay, shucks, moss, and cotton. We build them of various sizes for these various purposes.

No. 1. For Hemp, the bale is 26x26x45 inches, extra heavy.

No. 2. For Hair, the bale is 24x24x52 inches, extra heavy.

No. 3. For Hay, Rags, Moss, and Shucks, the bale is 28x28x48 inches.

No. 4. For Cotton the bale is 24x30x60 inches, extra heavy.

The smaller sizes weigh about 1,600 lbs. The Cotton Press weighs about 1,800 lbs.

They can be shipped either set up or knocked down, as required. The Cotton Press is well adapted to the South American trade. It is a 6-hoop Press.

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FOR PRICES SEE ACCOMPANYING LIST.

HORIZONTAL AMBER CANE OR SORGHUM MILL.

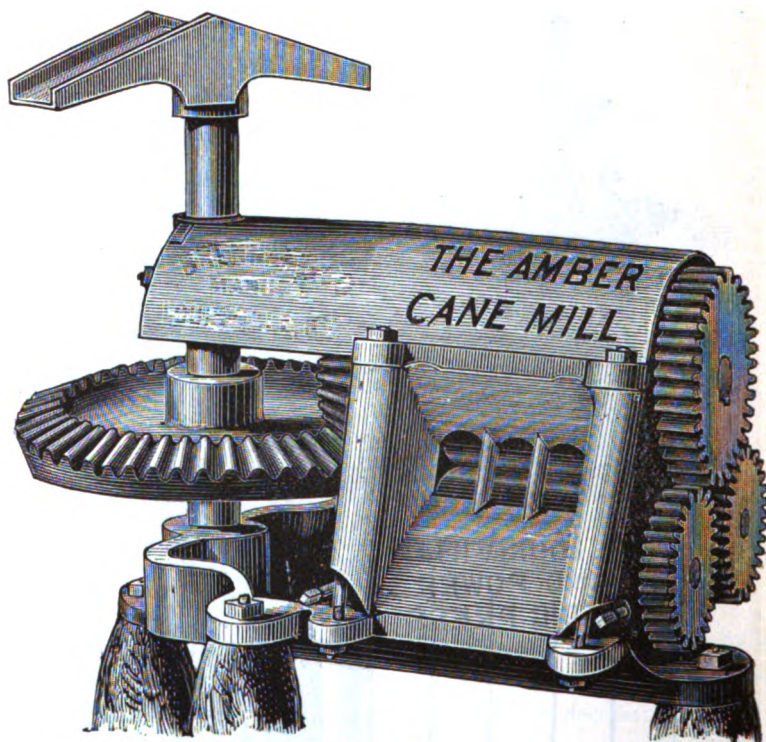


Fig. 1207.

We claim for these Mills :

- 1st.—Extra strength in construction over other horizontal Mills.
- 2d.—Our reversible feed guide, enabling the operator to work the Mill right or left handed, gee or haw, and thus doubling the durability of the cog gear.
- 3d.—Our angular sweep.cap, by which the Mill can be operated with a straight lever or sweep.
- 4th.—Our reversible scraper at the rear of the Mill to prevent small pieces of cane from falling into the juice and clogging up the Mill.

SIZES AND WEIGHTS.

HORIZONTAL.	Lower Rollers.		Upper Rollers.		Weight.	Capacity Per Hour
	Diameter.	Length.	Diameter.	Length.		
No. 1.—One-horse.....	6 inches	6¾ inches.	9 inches.	6¾ inches.	520 lbs.	60 gal.
No. 2.—One or two-horse	6 inches.	9¾ inches.	9 inches.	9¾ inches.	610 lbs	75 gal.
No. 3.—Two-horse.....	6 inches.	13 inches.	9 inches.	13 inches.	730 lbs.	100 gal.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

"KENTUCKY" SORGHUM AND SUGAR CANE MILLS.

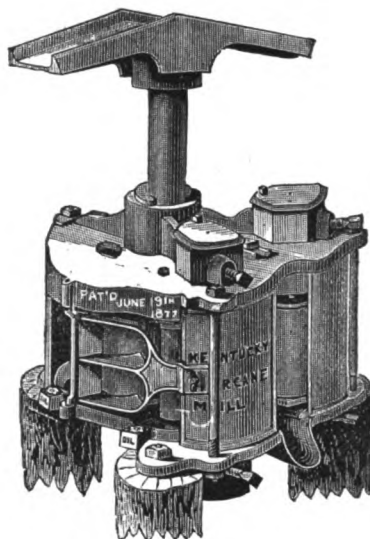


Fig. 1208.

The above celebrated "Kentucky" Sorghum and Sugar Cane Mill we have manufactured for the last fifteen years. We have made the requirements of this trade a study, and the Mill, as now built, is the result of a long experience with cane and sorgho machinery, coupled with great skill in mechanical details, and we can confidently recommend them to our trade as the best in the market. They are furnished on the following

WARRANTY:

The "Kentucky" Mills are warranted to do good work, and as much of it, as any Mill of their size in the market, to be amply strong for the power indicated in the list of capacities, and are warranted against all breakages resulting from manifest defects in the materials or workmanship.

SIZES AND CAPACITY OF MILLS.

No. 0, Small one-horse.	Capacity, 40 gall. per hour.	Weight, 370 lbs.
" 1, Light "	" 60 " "	" 500 "
" 2, Regular "	" 80 " "	" 720 "
" 3, Regular two-horse.	" 100 " "	" 900 "
" 4, Heavy "	" 120 " "	" 1200 "

Each Mill has Three Rollers of the following Sizes:

No. 0.	High.	inches.	Large Roller, Diameter.	Two Small Rollers, Diam.
" 1.	5 $\frac{1}{2}$	"	10 $\frac{1}{8}$	6 $\frac{1}{8}$
" 2.	6 3-16	"	11 $\frac{1}{8}$	6 $\frac{3}{4}$
" 3.	7 $\frac{1}{8}$	"	13 $\frac{1}{8}$	7 $\frac{1}{8}$
" 4.	9 $\frac{3}{4}$	"	14 13-16	8
	12	"	16	9 11-16

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FOR PRICES SEE ACCOMPANYING LIST.

POINTS OF SUPERIORITY CLAIMED FOR THE "KENTUCKY" MILLS.

ECONOMY IN FIRST COST AND REPAIRS.

These mills have the gearing cast separate from the rolls, so that in case of breakage of a gear, an outlay of about three dollars will buy a new one. In other mills where the gear and rolls are cast together, the breaking of even one tooth in the main gear involves an expense of from twenty dollars to one hundred dollars, according to the size of the mill. The price of these mills is much less than any other first-class mill, owing to the simplicity of the mill and the low cost for labor and material, as well as our superior facilities for manufacturing.

ENCASED GEARING—SAFETY IN OPERATING.

The top plate is made with a flange which strengthens the plate, and at the same time covers the gear, so that all danger to the operator is obviated, and the clogging of gearing prevented. A small hole is provided in the top plate to introduce oil or lard to the gear when required.

STRENGTH AND DURABILITY.

Every part of the mill is made in the strongest manner, and of the best material; the metal being distributed in the most judicious manner for strength. You pay for no material which is not wanted or needed. The shafts are made of the best Kentucky rolled iron, and the castings of the best charcoal pig-iron, tested by the highest standard of strength. The top and bottom boxes are of easy access for oiling, and if kept properly oiled will last for years without any cost for repairs. When the boxes are worn out they can be renewed at a very small expense. These mills can be used either as right or left hand; this adds to their durability by making the wear and strain more uniform. To use it right hand it is only necessary to remove the feed-box to the opposite side of the mill, and work the horses gee instead of haw, and change the opening between the large and small rollers. We clean out the sand from the rollers; other manufacturers leave it in and plug up the holes, weigh it, and call it iron. Sand weighs heavy and is cheap.

SIMPLICITY.

By simply removing four nuts with the wrench provided, the mill can be taken to pieces and access had to any part of it for cleaning or repairs. Every journal can be oiled without removal of any part. The sweep-cap fits to shaft by square eye, which permits the cap and sweep to be removed together without unbolting the sweeps from the cap. There is not a key about the "Kentucky." With no tools but a wrench the operator can take his mill to pieces and put it together again in from ten to fifteen minutes.

OUR NEW IMPROVED PATENT REVERSIBLE FEED GUIDE.

The Feed Guide on the "Kentucky" is made so as to be worked on either side of the mill. It has a division which facilitates the operation of feeding, keeps the stalks in place, and prevents them from lapping and crowding, and thereby overstraining in the mill. Our feed guides are so constructed that advantage is had of using the full length of rolls; other makers contract the guide so that the work is limited to less than the whole face of the rolls.

IMPROVED SWEEP-CAP.

The angling sweep-cap, used only on the "Kentucky," is a great improvement. By this plan you can use a straight sweep instead of having to rig a bent one, as is necessary with ordinary mills. This feature taken in connection with

THE LONG MAIN SHAFT,

makes it possible to set the mill near the ground, so that it is more convenient for the operator to feed, and requiring shorter posts or frame, thus improving the running of the mill, as it stands firmer and runs steadier the nearer it is to the ground.

LIGHTEST RUNNING MILL.

Being free from all clogging of cane between the teeth and rolls, and the rolls being raised from bottom plate, and having their bearings in a lubricated box in the bottom plate, the "Kentucky" is thereby relieved from the friction common to other mills, and consequently runs with much lighter draught.

QUALITY OF WORK.

The work done by the "Kentucky" is of the best quality. It presses the cane dry, so that the bagasse can be burned—only a strong mill can do this. Mills with wooden rolls leave from thirty to fifty per cent. of juice in the cane. Those with cast shafts will break if rolls are set close, while those with rubber springs, etc., take care of *themselves* when the pressure is heavy by opening the rolls and allowing the cane to pass through *unpressed*.

FEEDS EASILY.

The rolls on the "Kentucky" serrated are all feed rolls when required. This is a great improvement over the old fluted roll, as it does not break the cane, but enables the mill to be worked either right or left hand, and feeds and discharges the stalks with more regularity and certainty.

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FOR PRICES SEE ACCOMPANYING LIST.

“Kentucky” Mills, for Power.

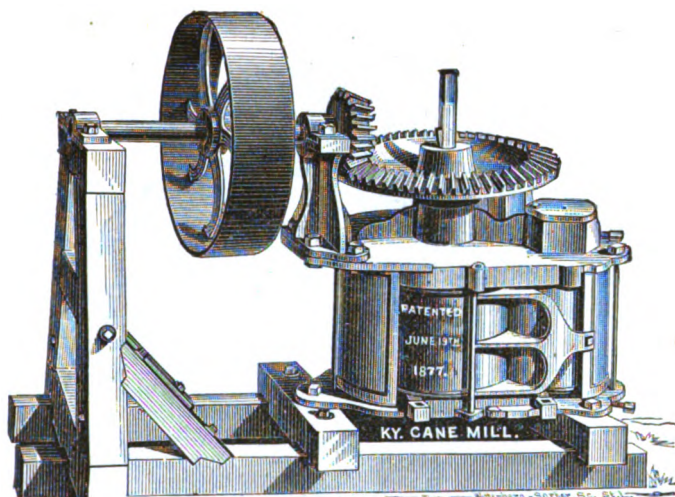


Fig. 1200.

We herewith present a view of one of our “Kentucky” Cane Mills, rigged for the application of Steam Power. We furnish Nos. 2, 3 and 4 Kentucky Mills rigged in this style. As will be noticed, the rollers and working parts of the machine are the same as found in the corresponding sizes of the “Kentucky” Mills for Horse Power, and, indeed, by removing the Gearing and Hangers and putting the sweep Cap on to the upright shaft, the Power Mills may be restored to their original condition so as to be operated by horses.

The “Power” Mills differ from the regular “Kentucky” series in the addition of the following parts:

1st. A Large Top Plate, which is arranged to receive the bearing for the inside end of the Horizontal Shaft.

2d. The Inside Upright Bearing for Shaft.

3d and 4th. The Bevel Wheel and Pinion, each of which is firmly keyed to its respective shaft. This gearing is well proportioned, is made with extreme care, and has ample weight to secure very great strength. In this particular it is adapted to maintain the well-earned reputation of the “Kentucky” as the “Strongest Cane Mill in the Market.”

5th. The Shaft itself, which is stiff and strong, so that it is practically impossible for it to be sprung, a matter which is of great importance where long belts are used.

6th. The Outside bearing for shaft; and

7th. The Driving Pulley. This Pulley is 24 inches in diameter, and has 6 inch face. It makes about three revolutions to one of the main upright shaft, an item that must be noted in speeding the mill.

The cut which we give shows a suitable form of frame work for use in connection with our Power Mills. The parts of such a frame should be firmly braced and tied together with bolts, and where a long driving belt is to be used the outside bearing should be moved 8 or 10 inches closer to the mill.

N. B.—We do not furnish this nor any frame work with our Power Mills.

SIZES OF “KENTUCKY” POWER MILLS:

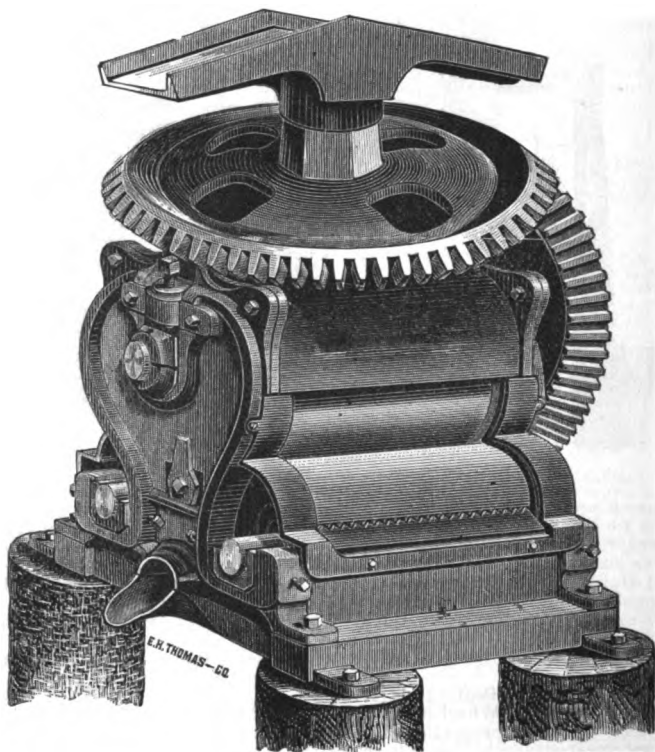
SIZE.	CAPACITY.	SPEED.*	SHIPPING WEIGHT.
No. 2.	105 gallons per hour.	12	950
No. 3.	130 gallons per hour.	12	1,150
No. 4.	160 gallons per hour.	12	1,500

*Number of revolutions of Driving Pulley per minute.

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FOR PRICES SEE ACCOMPANYING LIST.

FALLS CITY HORIZONTAL CANE MILL.



This Mill is built extra heavy and strong, and is reversible like our Vertical Mills, that is, the horses can walk haw or gee, thus making it more durable and convenient than those mills which only allow working one way. The operator can easily make a wood table, or feed trough, to be placed on a line with the opening between the two rollers which will hold the cane while it is being drawn through and enable him to feed much faster. This Mill is intended for two horses, but for light use one horse can operate it, as it runs very free and easy.

This Mill can be changed to a steam or water power mill by simply removing the bevel gear wheels and putting a pulley on to the main shaft where the smaller bevel wheel is shown. If this is done the pulley should run very slow, from four to five turns per minute.

SIZE OF ROLLERS:

	Large.	Small.
Diameter.....	11 $\frac{1}{2}$ inches.....	7 $\frac{1}{2}$ inches.
Length.....	14 inches.....	18 $\frac{1}{2}$ inches.

We believe this Mill capable of grinding in good cane enough to produce from 125 to 150 gallons per hour.

Weight of Geared Mill.....	1,110 lbs.
Weight of Pulley Mill.....	950 lbs.

No. 1, with Gear Wheels as shown in cut. No. 2, without Gear Wheels and Pulley, 24x6.

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FOR PRICES SEE ACCOMPANYING LIST.

THE COOK EVAPORATOR.

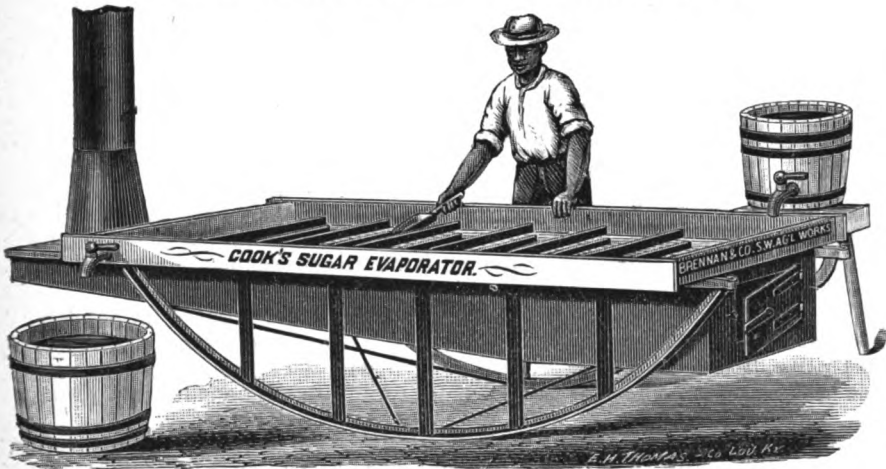


Fig. 1211.

THE WILLIAMS' PATENT
SELF-SKIMMING EVAPORATOR.

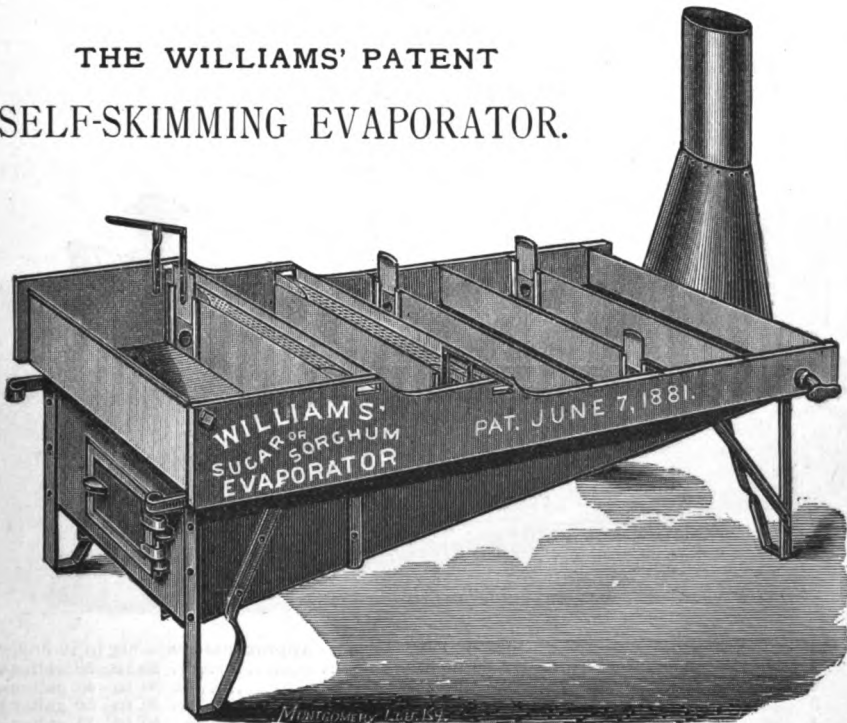


Fig. 1212.

Sizes and Capacities of above Pans same as figure 1213.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES, SEE ACCOMPANYING LIST.

EVAPORATORS.

On preceding page we show illustrations of the two best EVAPORATORS now in use, **the well-known Cook's Patent and the Williams' Self-Skimming Patent.**

We are now manufacturing these two kinds, and confidently say that they are undoubtedly the best we know of in the market. The Cook's Evaporator has had a great reputation all over the United States, and been the favorite for years.

The Williams' Self-Skimming Evaporator was only patented and introduced last year, and we thought so favorably of it that we purchased the patent of the patentee, and now own the same. It has a great merit in its self-skimming principle that greatly reduces the labor and the close attention required of the operator.

We find it more expensive to build than the Cook's, but to introduce it more extensively, have concluded to put it in the same list of reduced prices for 1883. We have reduced the price-list all through the series, and at the same time have engaged competent workmen, who will turn out none but good work from our factory.

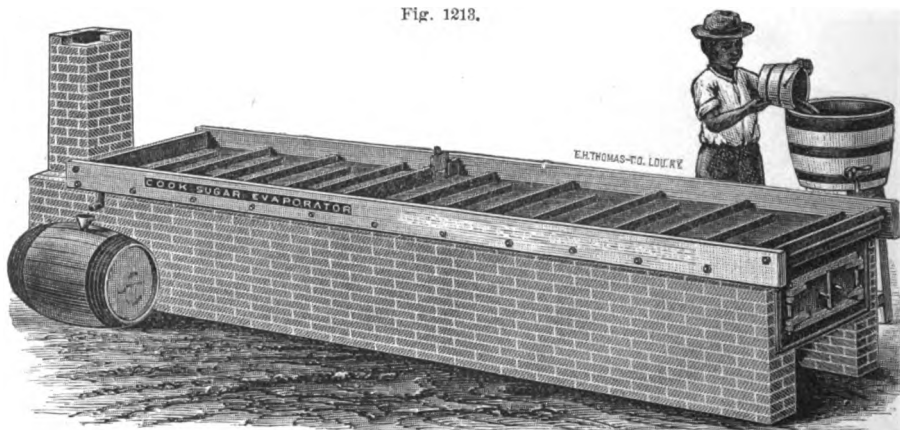
The best quality of charcoal, galvanized iron and hard rolled copper will be used in the construction of the pans, and good heavy iron in the furnaces.

Below we give an illustration of the Cook's pan for brick or stone arches. These we build as well as the Williams' for Nos. 3, 4 and 5, with a gate and one high ledge as shown; larger pans for brick arches Nos. 6 and 7, with two gates and two high ledges.

We also build the Williams' Pans, Nos. 3, 4, 5, 6 and 7, for brick or stone arches.

STATIONARY EVAPORATOR.--PAN FOR BRICK ARCH.

Fig. 1218.



SIZES.		
Number.	Size of Pan.	Approximate capacity in 12 hours.
1	44x 66 inches.	25 to 30 gallons.
2	44x 72 inches.	80 to 40 gallons.
3	44x 90 inches.	40 to 50 gallons.
4	44x108 inches.	50 to 75 gallons.
5	44x126 inches.	75 to 125 gallons.
6 { For brick }	44x144 inches.	125 to 150 gallons.
7 { arch only, }	44x180 inches.	150 to 200 gallons.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PORTABLE WOOD SAW AND FRAME.

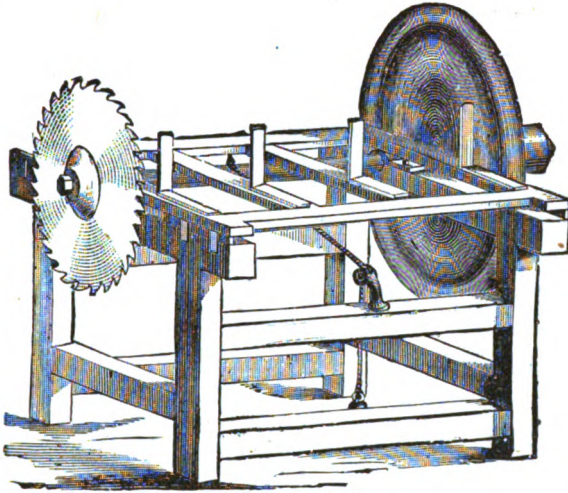


Fig. 1214.

This cut represents the Portable Circular Saw and Table for sawing fire-wood, etc. With a one-horse power they will saw from fifteen to twenty cords of wood per day, and with a two-horse power just as much as three men can handle. It can also be used to advantage in cutting off fencing stuff, or building material of any kind, and is a very useful machine for the farmer. Furnished with 24-inch Saw and Frame complete.

New Self-Feed Kentucky Shingle Machine.

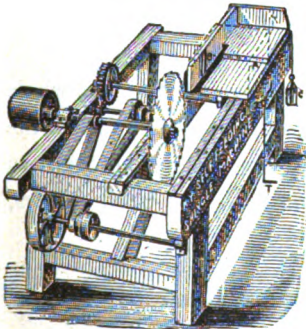


Fig. 1215.

DESCRIPTION.

This cut illustrates our New Self-Feed Kentucky Shingle Machine. We build this machine to run with a 24-inch circular saw. It is strong, durable and simple, can be driven by small agricultural engines or by water power; it is capable of cutting from five to eight thousand shingles per day; all the operator has to do is to rock the block by one hand, while he places his foot on the treadle to start the feed and by removing his foot from the treadle the weight brings back the block and slide table for the next cut.

No. 1. Furnished with 24-inch Saw and inside Belts.

No. 2. With Saw Table and gauge for sawing orange slats, strips, etc.

No. 3. Without Self-Feed.

SAW MANDRELS.

No.	Pulley.		Diam. Collar.	Shaft.		Saws.	
	Diameter.	Face.		Diameter.	Length.	Hole.	Diameter.
1,	3 in.	3½ in.	3 in.	1 in.	19 in.	1 in.	10 to 12 in.
2,	3½ in.	4½ in.	3½ in.	1½ in.	22½ in.	1½ in.	14 to 16 in.
3,	4 in.	5 in.	4 in.	1½ in.	25 in.	1½ in.	18 to 24 in.
4,	6 in.	7 in.	4 in.	1½ in.	28 in.	1½ in.	24 to 28 in.

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FOR PRICES SEE ACCOMPANYING LIST.

PLANTATION SAW MILL.

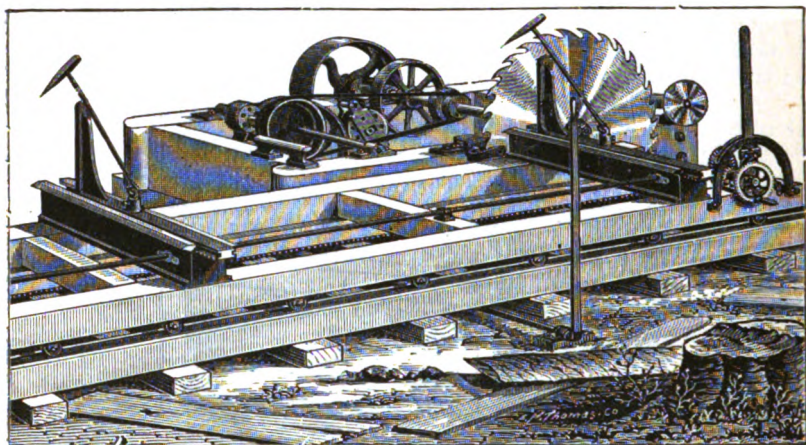


Fig. 1216.

The above cut illustrates our Plantation Saw-mill. This is a light mill that can be run successfully by Portable Threshing Engines or Small Water Powers, and will handle logs up to three feet in diameter. This mill embraces

ALL THE LATE IMPROVEMENTS.

It is capable of cutting from 2,500 to 3,500 feet of lumber in a day, requiring but one hand to start, back and stop the mill and set the log, and the whole mill can be easily transported in two common country wagons. In fact the mill, carriage, head blocks, saw and track irons can be hauled in one common two-horse farm wagon, as it weighs, without the mud-sills and track timbers, only 2,400 pounds. These mills have

Double Setting Lever, and Back and Pinion Head Blocks,

TAKING IN 33 INCHES,

20 feet of carriage running on rollers, 50 feet of iron ways, and we furnish with them one saw wrench, one bolt wrench, one swage, one saw-set, one oil can, bolts to bolt the mill down, and screws for the track irons, and deliver at wharf or railroad depot here.

SIZES OF SAWS.

36, 38, 40, 42, 44, 46, 48, 50 or 52 inches.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

PONY SAW MILL.

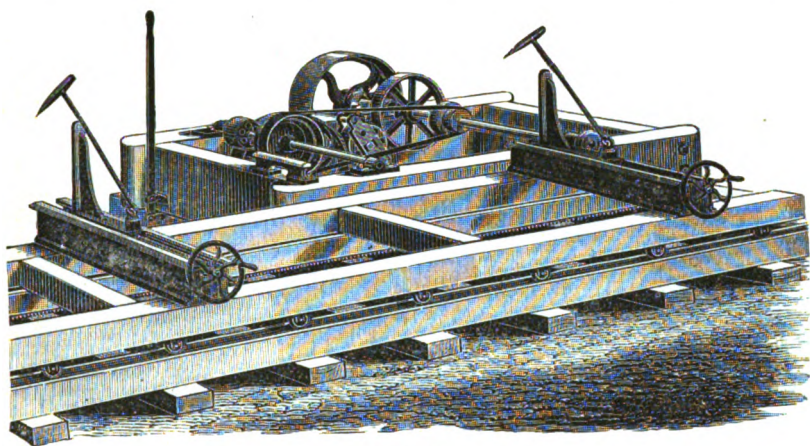


Fig. 1217.

This mill is built after the same pattern as the Plantation Mill, except the head blocks and carriage. With this mill are furnished two independent screw head blocks, opening 29 inches.

It will carry saws up to 52 inches diameter; can be driven by an eight horse engine, and will saw about 2000 feet per day. Carriage is 18 feet on short side and 21 feet on rack side.

Weight, 2000 lbs.

“A”

STANDARD SAW MILL.

This is a large, heavy mill carrying saws from 48 to 60 inches diameter. It is fitted with latest improved PAPER FRICTION FEED and Meiner's patent double setting lever and screw head blocks. Carriage is 24 feet on short side and 30 feet on rack side.

Weight, single mill 4000 lbs; double mill 5000 lbs.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

EVERY FARMER'S HORSE POWER.

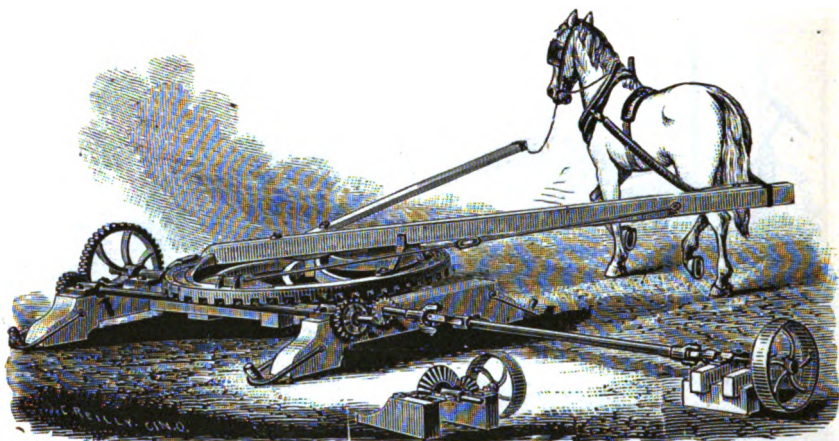


Fig. 1218.

The above cut illustrates our new Farmer's Horse Power, a machine wanted on every farm. This machine combines strength and lightness, real merit and cheapness, and is what we have tried for several years to get up and add to our list of Agricultural Implements. We furnish a pulley 12 inches diameter, $3\frac{1}{2}$ inch face, to go on the end of the Tumbling Shaft, and at the ordinary walk of a horse or mule, this pulley or Tumbling Shaft on which it revolves may have three different speeds. When the Tumbling Shaft is attached to Main Shaft it runs $22\frac{1}{2}$ times a minute; when attached to first Counter Shaft it runs 96 times a minute, when attached to second Counter Shaft it runs 205 times a minute. The first speed is for pumping water and running a grindstone; the second for churns, cider-mills, fan-mills, small corn-shellers and small fodder cutters; the third for larger kinds of corn-shellers and fodder-cutters.

We also furnish, when ordered, a bevel-gear'd Jack and Pulley to attach to the Tumbling Shaft. This is for sawing wood, which requires a high speed.

No. 1, furnished with Tumbling Shaft and Pulley,

No. 2, furnished with Tumbling Shaft and Bevel-Geared Jack and Pulley,

Total weight, 600 pounds.

No. 3, Two-horse power, Weight, - 1,000 pounds.

No. 4, Four-horse power, Weight, - - 1,500 pounds.

Prices of Six, Eight and Ten-horse lever powers, also of One to Four-horse Endless Chain or Railroad Powers furnished upon application.

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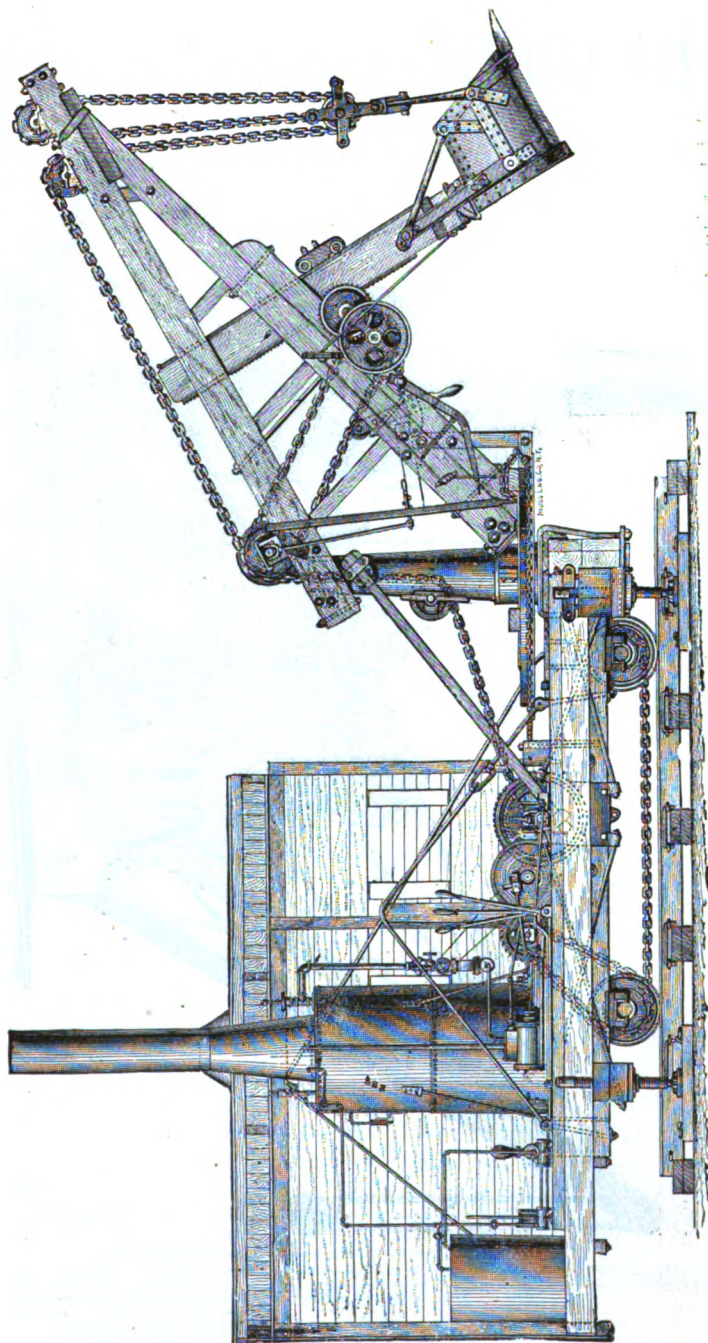
FOR PRICES SEE ACCOMPANYING LIST.

Agents for the KINGSFORD FOUNDRY AND MACHINE WORKS.

MANUFACTURERS OF

LAND EXCAVATORS.

Fig. 1210.



22 CORTLANDT STREET, NEW YORK.

PRICES AND FULL PARTICULARS UPON APPLICATION.

LOCOMOTIVE STEAM CRANE.

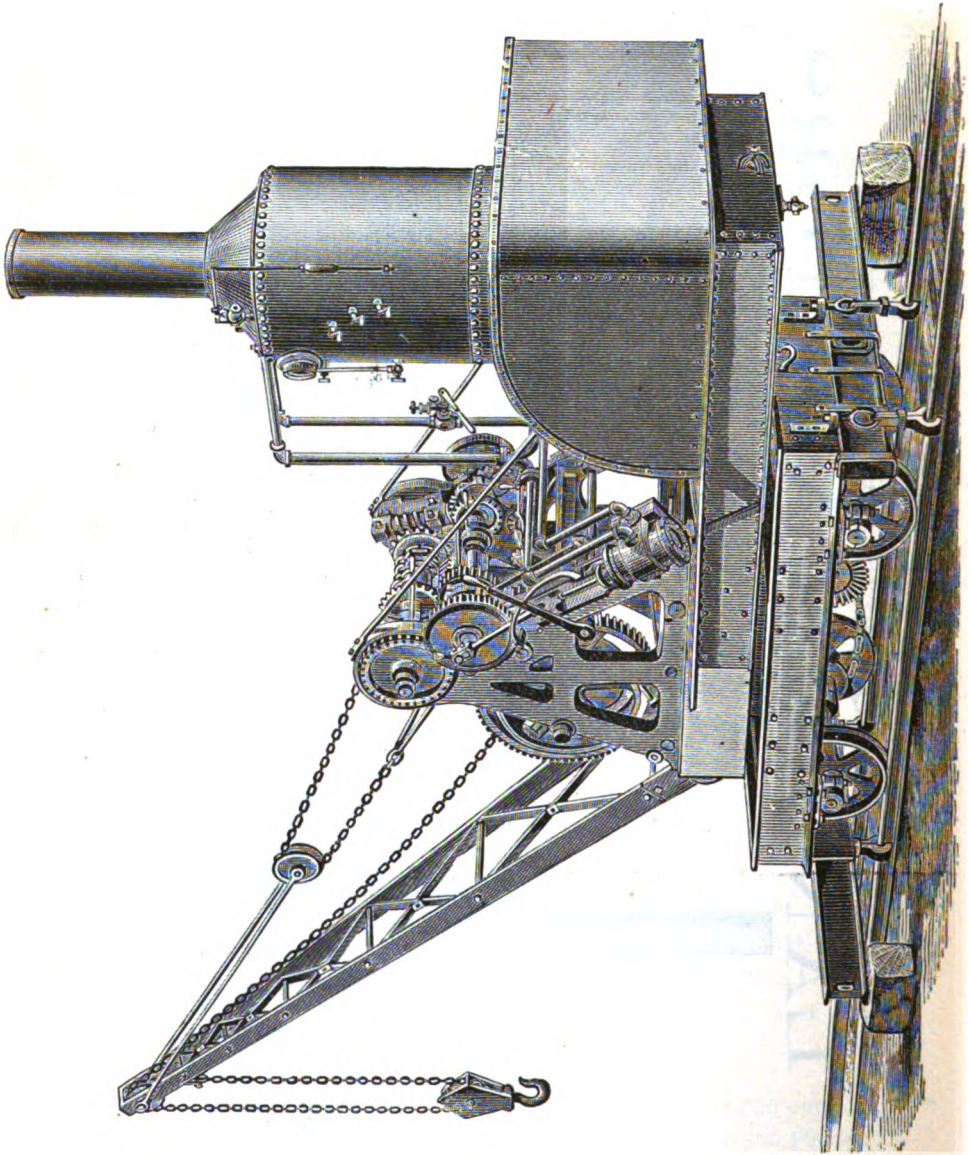


Fig. 1290.

Description, prices and full particulars on application.

22 CORTLANDT STREET, NEW YORK.

IMPROVED SPUR GEARED HOIST, WITH BOILER.

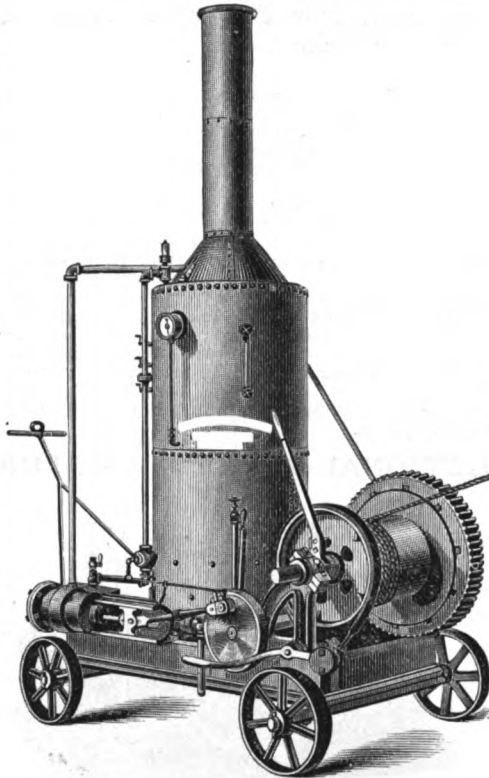


Fig. 121.

This Engine is designed for either portable or stationary purposes, and can be constructed either with or without wheels. All its parts are constructed with the view of convenience, combined with strength and durability. It is adapted for Pile Driving, Contractors and Builders, Quarries, Loading and Discharging Vessels, or general hoisting; and can be used for driving a Pump, line of Shafting or other machinery.

STYLE OF ENGINE.		Power.	CYLINDER.		BOILER.		TUBES.			Dia. of Drum.	Duty of Engine lbs.	
			Bore.	stroke.	Dia.	Height	No.	Dia.	Length			
HORIZONTAL OR VERTICAL.	Double Engines connected to same Crank Shaft.	One Drum.	6	8	32	63	41	2	39	10	1800	
			10	7	10	34	72	49	2	48	12	3000
			12	7	10	36	72	55	2	48	12	3000
		Two Drums	12	6	8	36	78	55	2	54	12	3600
			20	7	10	40	90	85	2	60	12	6000
			12	6	8	36	78	55	2	54	12	1800
	Double Vertical Independent Engine.	20	7	10	40	90	85	2	60	12	3000	
		6	6	8	36	78	55	2	54	10	1800	
		10	7	10	40	90	85	2	60	12	3000	
		ALL BOILERS OF 36-INCH DIA. AND OVER ARE DOUBLE RIVETED, AND HAVE INSIDE CIRCULATING SHELL.										

These Engines are constructed either with Clutch or Cone Friction.

The Clutch Engine is operated by a Clutch working into the small Gear Wheel. The Drum is controlled by a powerful Strap Brake, and the Engine is fitted with a Relief Valve, by which it can be backed down with the load, if desired, without throwing out the Clutch. This Engine is well adapted for Quarries, Contractors, Stevedores, and General Hoisting.

For Cone Friction Engine see description on page 438.

EVERY ENGINE TRIED WITH STEAM BEFORE LEAVING OUR WORKS.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Cone Friction Drum Pile Driver and Hoisting Engine.

PATENTED MAY 14th, 1878.

For Sizes, etc., see page 437.

The Drum is loose on the Shaft, and at one end has a powerful Conical Friction which works into a corresponding Cone in the Gear Wheel keyed fast to the Shaft. In the Large Engines the Gear Wheel Cone is lined with Wood, and in the Small Engines the Cone of the Drum is lined with Leather, so that the Frictional contact is iron with either leather or wood.

The Cone of the Drum is forced into contact with the Gear Wheel by means of a Spiral Sleeve operated by a Hand Lever.

In lowering, the Drum revolves back free of the Gear, and is controlled by a powerful Strap Brake, lined with Wood, operated by a Foot Lever.

The improved Cone Friction Drum, by this arrangement, is especially well adapted for Pile Driving, as it admits of more blows being made per minute than is possible with the Clutch Engine.

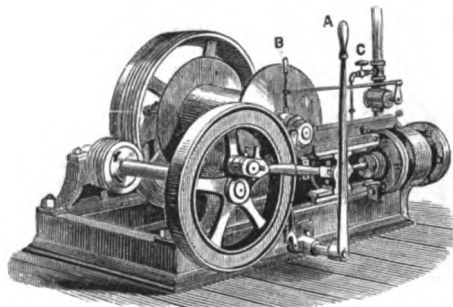
With the Clutch Engine the Hammer should be tripped, or otherwise the Drum, which is fast to the Gear, will cause the Gearing to revolve back with it, at great risk of breaking.

With the Cone Friction Engine it is not necessary to trip the Hammer, as the Drum is detached from the Gear, which not only obviates the risk of breaking, but also allows the Drum to revolve more freely, thereby causing the Hammer to strike heavier blows and with greater rapidity.

This Engine is adapted for Pile Driving, Contractors, Stevedores, and all kinds of Hoisting where speed in lowering is required.

PATENT FRICTIONAL-GEARED HOISTING ENGINE.

NO NOISE, NO COGS, NO
BREAK-DOWNS, ALL
WAYS READY.



DESIGNED FOR FAST HOIST-
ING AND QUICK HANDLING.

Fig. 1222.

SINGLE DRUM, FRICTIONAL-GEARED HOISTING ENGINE.

These engines are adapted for general work, such as deck hoisting, wharf purposes, miners and contractors. They are compact within themselves, with heavy cast-iron box bed-plate and are constructed throughout to guard against break-downs.

As a coal and cargo hoister, these engines have proved themselves to be superior to all others, and have sustained their reputation after six years' general use, during which time numerous other engines have been taken out and replaced by these. They are noiseless in operation and having no cog gear there is less danger of break-down.

Style of Engine.	Power.	Cylinder.		Duty of Engine.
		Bore.	Stroke.	
Single Engine.	6	6	6	1600 Lbs.
	12	8	8	3000 "
	20	10	10	4000 "
Double Engine.	13	6	6	Geared for Fast Hoisting.
	24	8	8	
	40	10	10	

These engines are in general use on board all the steamers of the Phila. & Southern Mail S. S. Co., the Phila. & Reading R. R. Co.'s Steam Colliers Wm. P. Clyde & Co., at the coal depots of the Phila. & Reading Coal and Iron Co., at Philadelphia, New York, New Bedford, Newburyport and Salem, also by the Lehigh & Wilkesbarre Coal Co., Cromwell Steamship Line of New York, and numerous others.

Every Engine tried with Steam before leaving our works.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

The Greenfield Vertical Engine.

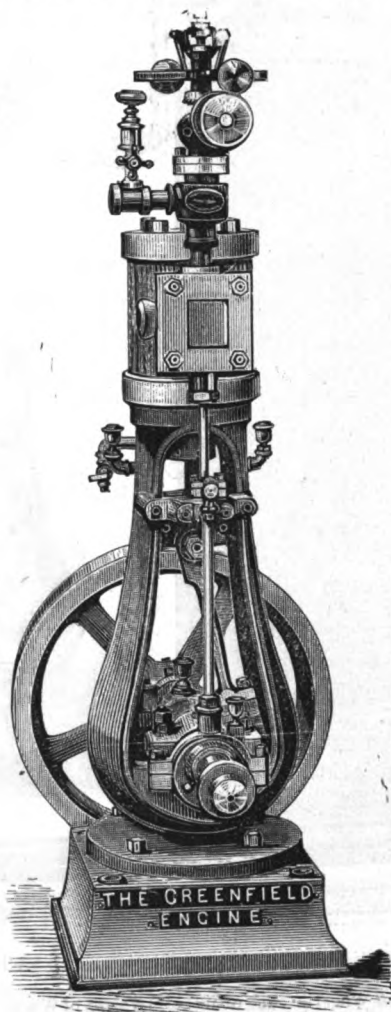


Fig. 1228.

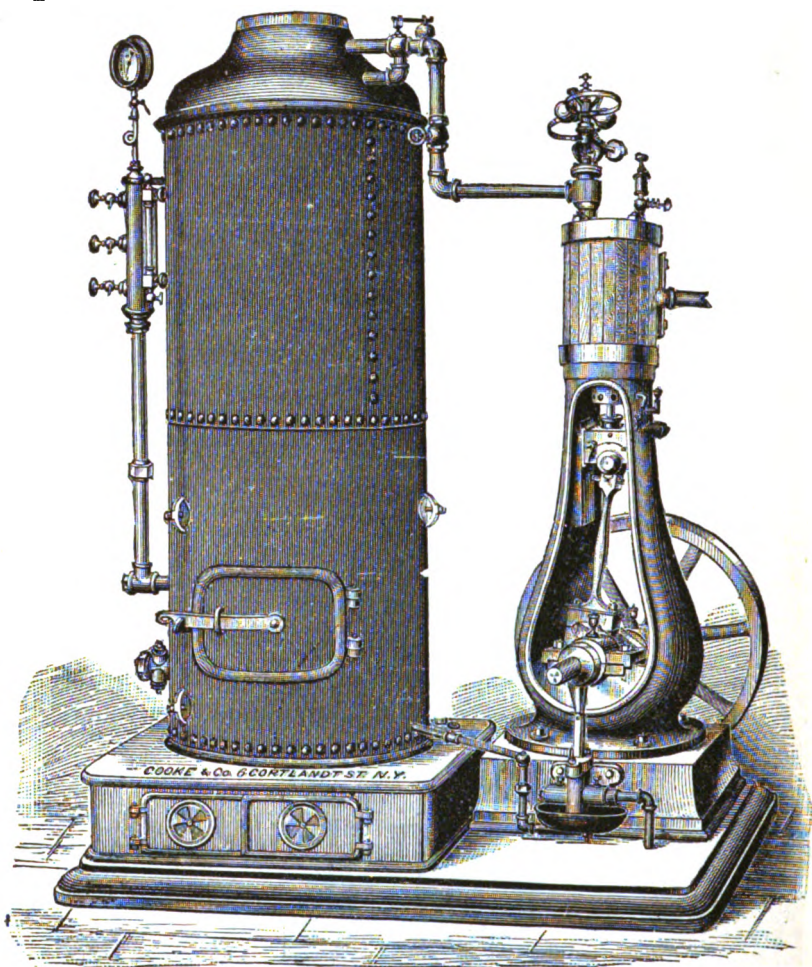
These Engines are manufactured with great care, from the best materials, and the workmanship is of the best quality, all the parts being fitted in a thorough and workmanlike manner. The Steam Joints are scraped and ground to a perfect bearing, thus obviating the annoyance of gum or paper joints. The Shaft, Piston Rod, Valve Rod, and Cross-head pin, are made of forged steel. The Cross head is fitted with composition gibbs, that are adjustable (to take up the wear). The Piston is fitted with spring rings. All the moving parts are evenly balanced, thus assuring steadiness and smooth running. These Engines are finely finished and the parts are made interchangeable. They are all that good work and good material can possibly make them. The Engine is furnished with Boiler on same base, when called for. The "Waters" Governor is furnished with the Engine.

For list of sizes and dimensions, see page 440.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

THE GREENFIELD VERTICAL ENGINE AND BOILER COMBINED.



DIMENSIONS AND WEIGHTS OF GREENFIELD VERTICAL ENGINE.

H. P.	Size of Cylinder	Diam. of Wheel in inches.	Face of Wheel in inches.	Weight of Wheel, lbs.	Size of Base.	Revolutions.
2½	3¼ x 5	20	3¼	90	16x16	250
3	3¾ x 5	20	3½	110	16x16	250
4	4 x 6	24	4	160	19x19	200
5	5 x 6	24	4½	200	21x21	200
6	5¾ x 6	24	5	225	21x21	180
8	7 x 7	30	6	350	24x24	180
10	7½ x 8	36	7	425	30x30	165
12	8¼ x 8	36	8	475	30x30	165
15	9 x 9	36	9	575	34x34	150
20	10 x 12	48	10½	900	40x40	150
25	11 x 12	48	12	1100	44x44	150
30	12 x 12	60	12	1500	48x48	150

For dimensions of Boilers, see page 443.

22 CORTLANDT STREET, NEW YORK.

The Greenfield Yacht Engine,

FOR PLEASURE YACHTS, TUG BOATS AND SMALL STEAMERS.

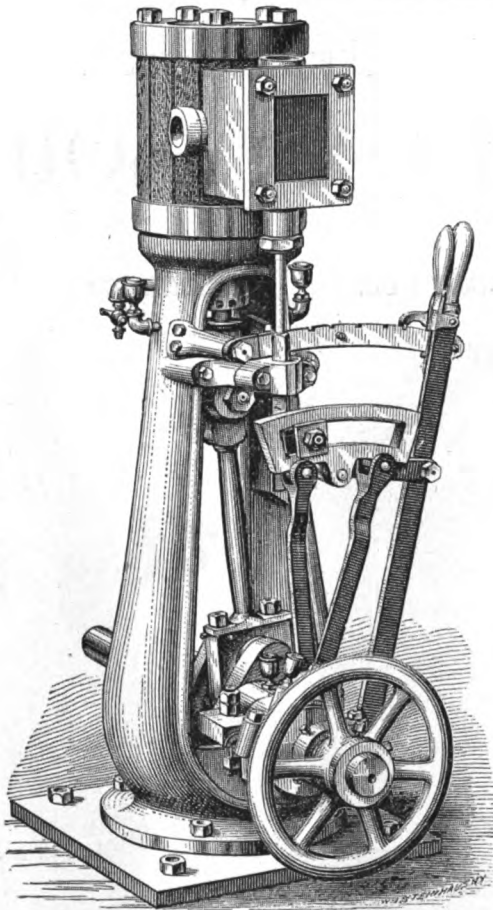


Fig. 1225.

These engines are of the same general style as the stationary engines, and are fitted with reversing gear and arranged with notches for working steam expansively. Sizes same as stationary engines, page 440.

Yacht Boilers, Made of Steel and Flange Iron.

SIZES.

No.	Diam. of Cylinder, suitable for, inches.	Diam. of Boiler, inches.	Height of Boiler, inches.	TUBES.		Heating surface, square feet.	Length of boat suitable for, feet.
				Diameter, inches.	No.		
1	3 $\frac{1}{4}$	28	48	1 $\frac{1}{4}$	84	60	25
2	3 $\frac{3}{4}$	30	48	1 $\frac{1}{4}$	150	95	28
3	4	33	48	1 $\frac{1}{4}$	180	104	30
4	5	36	48	1 $\frac{1}{4}$	204	137	32
5	5 $\frac{1}{2}$	36	54 $\frac{1}{2}$	1 $\frac{1}{4}$	204	197	35
6	7	44	66	2	120	205	38
7	7 $\frac{1}{2}$	46	76	2	136	256	40
8	8 $\frac{1}{4}$	48	82	2	144	280	45
9	9	50	82	2	180	380	65
10	10	54	85	2	204	430	70

22 CORTLANDT STREET, NEW YORK

FOR PRICES SEE ACCOMPANYING LIST.

UPRIGHT TUBULAR BOILERS.

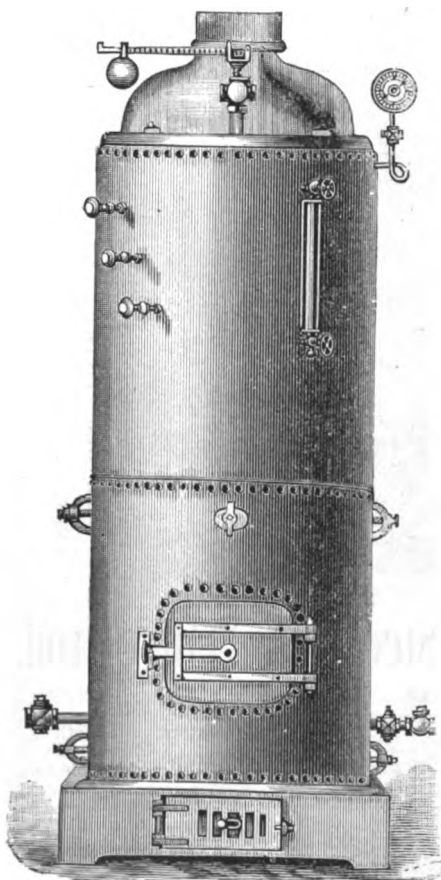
CAST-IRON BASE.

Fig. 1226.

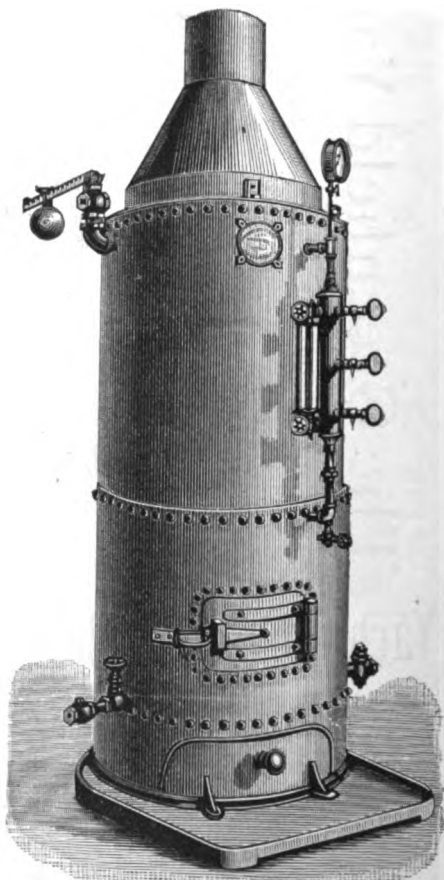
EXTENDED WROUGHT IRON BASE.

Fig. 1227.

For Sizes, Dimensions, etc., see page 443.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

UPRIGHT TUBULAR BOILERS.

FIGS. 1226 AND 1227.

Bases of Cast or Wrought Iron, most approved styles, with Large Ash Doors.—Hoods of Improved Patterns.—Hand-
holes above and below Crown Sheet.

TWELVE SQUARE FEET OF HEATING SURFACE TO THE HORSE POWER.

Number of Size.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
HORSE POWER.....	3	5	6	7	9	12	12	15	18	23	27	31	36	41	47	50
Diameter of Boiler.....in inches,	24	24	24	30	30	30	36	36	36	42	42	42	48	48	48	54
Height of Boiler.....in feet...	4	5	6	5	6	7	6	7	8	8	9	10	9	10	11	10
Diameter of Furnace.....in inches,	20	20	20	25	25	25	31	31	31	37	37	37	43	43	43	48
Height of Furnace.....in inches,	24	24	24	24	27	27	27	27	27	33	33	33	38	38	38	38
Length of Tubes.....in inches,	24	36	48	38	45	57	45	56	69	63	75	87	76	87	98	87
Diameter of Tubes.....in inches	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Number of Tubes.....	31	31	31	53	53	53	63	63	63	88	88	88	134	124	124	150
Actual Square Feet Fire Surface.....	45	60	75	90	118	148	151	186	221	280	325	378	485	500	565	608
Approximate Weight with Base and Grates.....	1900	1400	1650	1950	3150	3350	3000	3200	3500	4300	4600	4900	5900	3350	6750	7550

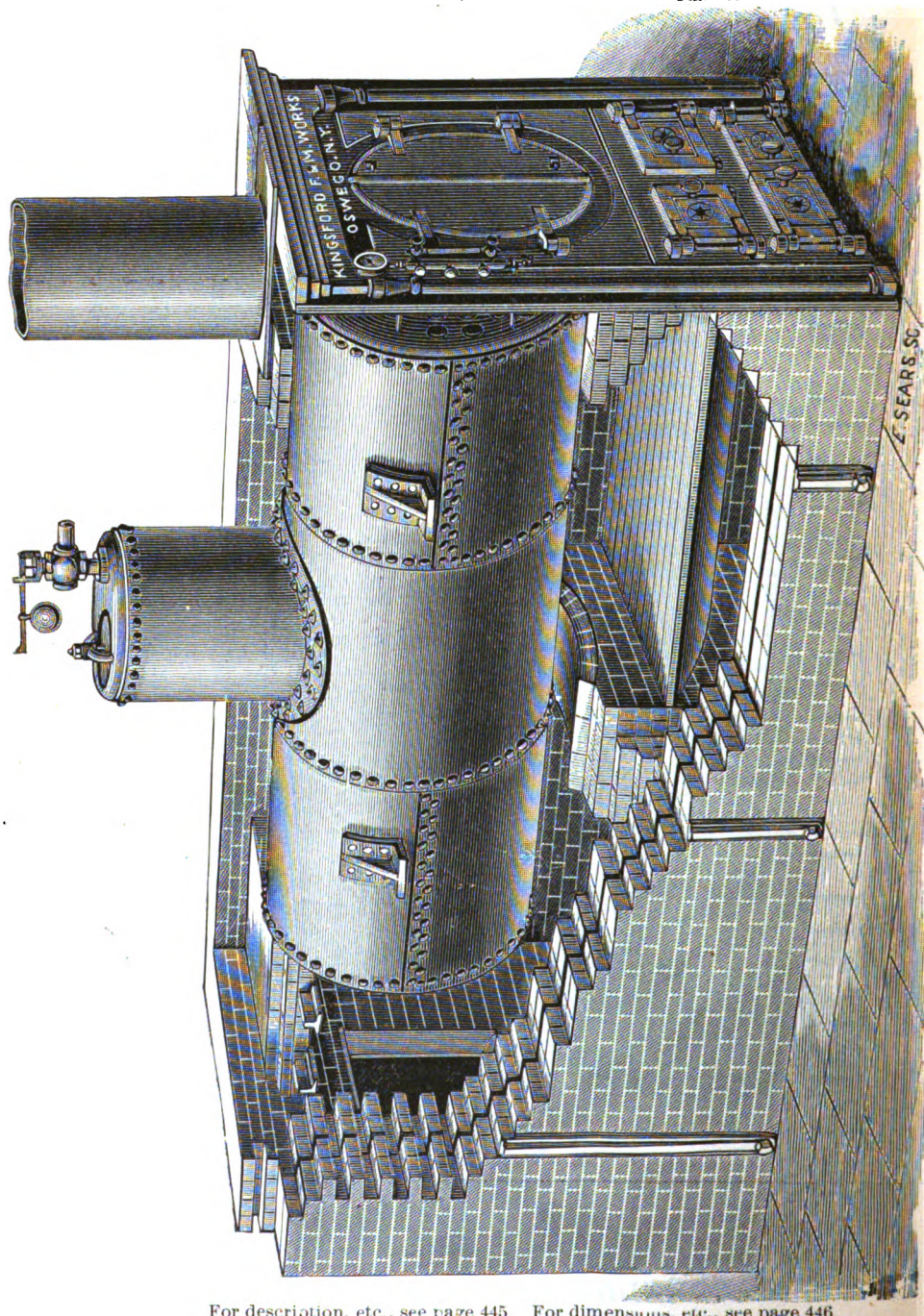
The smaller sizes have two and the larger sizes three *hand holes* in the water leg around the fire, and the same number *over the crown sheet*.

The Base and "Fixtures" which comprise the Steam Gauge, Water Gauge, Gauge Cocks, Safety Valve, Blow-off, Check and Stop Valves, will be according to order.

The base has a bottom plate raised from the floor to admit of a free circulation of air under it, which obviates the necessity of a *brick or stone hearth*.

HORIZONTAL STATIONARY BOILER,

CLASS A. WITH FLUSH FRONT, SET IN BRICK WORK. FIG. 1228.



For description, etc., see page 445. For dimensions, etc., see page 446.

GENERAL DESCRIPTION OF

STATIONARY BOILERS.

The shell of all our boilers, unless otherwise ordered, is made of "Shell Iron," heads and dome of best "Flange Iron." The tubes are the best "American Lap Welded."

We test all boilers with a hydrostatic pressure of 150 pounds to the square inch, before they leave the shop.

All horizontal seams are double riveted, and the heads are thoroughly braced.

Good hand-holes and man-hole in each boiler.

Smoke stacks are made of No. 16 iron, unless otherwise ordered.

The "Fixtures and Fittings," furnished with stationary boilers, consist of front, grate bars and bearers, supporting bars, binders or buck stays, back door, anchor bolts, safety valve, blow off cock, stop and check valve; water column with gauge cocks, pet cock, water gauge, steam gauge and syphon, whistle, smoke stack and guy rods (four times the length of stack).

We can build any of these boilers of steel at a slight advance on the price of iron boilers.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

STATIONARY BOILERS,

CLASS A, WITH FLUSH FRONT—FIG. 1228.

For description of Boiler and List of Fixtures and Fittings, see page 445.

DIMENSIONS.

Number.	1	2	3	3½	4	5	6	7	7½	8	9	10	10½	11	12	13	14	15
Horse Power.....	10	12	15	20	20	25	30	35	40	40	45	50	60	60	70	80	90	100
Diameter of Boiler, inches.....	30	36	36	36	42	42	44	44	44	48	48	54	54	60	60	60	66	66
Thickness of Shell, inches.....	¾	¾	¾	¾	No. 3	No. 3	No. 3	No. 3	No. 3	1½	1½	1½	1½	1½	1½	1½	1½	1½
Thickness of Heads, inches.....	¾	¾	¾	¾	No. 3	No. 3	No. 3	No. 3	No. 3	1½	1½	1½	1½	1½	1½	1½	1½	1½
Length of Flues, feet.....	8	7	8	10	8	10	10	12	14	12	14	12	15	12	14	16	15	16
No. of Flues (½ in. diam.).....	20	28	28	30	40	40	46	46	46	54	54	68	66	82	82	82	100	116
Square feet of Heating Surface.....	156	184	226	300	300	375	446	590	602	616	676	760	914	900	1050	1200	1350	1500
Height of Dome, inches.....	22	22	22	22	24	24	24	24	24	28	28	34	34	36	36	36	40	40
Diameter of Dome, inches.....	20	20	20	20	22	22	22	22	22	26	26	30	30	32	32	32	36	36
Diameter of Stack, inches.....	14	16	16	16	20	21	22	22	22	24	24	26	26	28	28	28	30	32
Length of Stack, feet.....	28	24	28	35	28	35	35	40	50	40	50	40	50	40	50	60	60	60
Weight of Boiler, about.....	1950	2350	2600	3000	3850	3830	4200	4700	5500	5900	6650	7400	8600	8800	9400	10000	12000	12400
Weight of Boiler fixtures, about.....	1250	1500	1550	1800	2050	2290	2400	2600	2925	3250	3550	3450	3700	3900	4200	4500	5000	5200
Weight of Boiler & fixtures, about.....	3200	3850	3750	4800	5400	6120	6600	7300	8425	9150	10200	10850	12300	12700	13600	14500	17000	17800

Grates for Boilers; having 7 feet and 8 feet tubes are 36 inches long; having 10 feet tubes, 42 inches long; having 12 feet tubes, 48 inches long; having 14, 15 and 16 feet tubes, 54 inches long; and the width of grates in all cases equals the diameter of the Boiler. Sawdust grates will be substituted, when ordered, without extra charge.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

HORIZONTAL STATIONARY BOILER.

CLASS B.

FOR DESCRIPTION, DIMENSIONS, ETC., SEE PAGE 448.

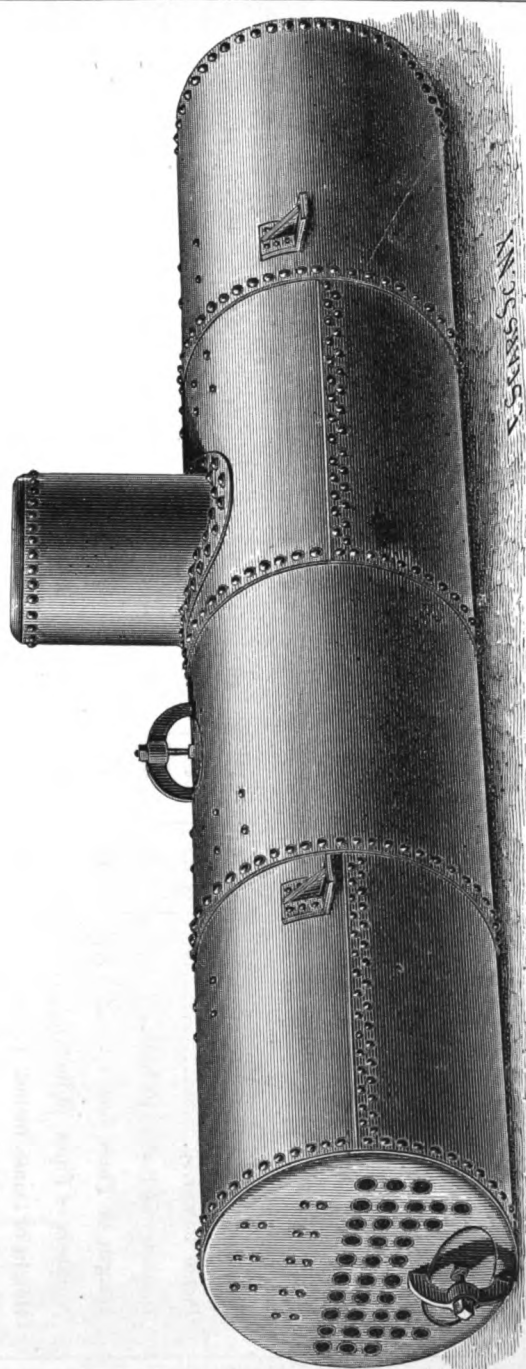


Fig. 1220.

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

HORIZONTAL STATIONARY BOILERS

Class "B"--Fig. 1229.

These Boilers, which are shown in cut on page 447, differ from those in Class "A" in being longer, of less diameter, and having a smaller number of tubes.

We put a manhole in front head of 40 horse power and larger Boiler; by this arrangement we get a large body of water directly over the fire, which is a great advantage when using a forced draft.

The fixtures and fittings are same as enumerated under class "A."

Number	16	17	18	19	20	21	22	23	24	25
Horse Power.....	20	25	30	40	50	60	70	75	85	100
Diameter of Boiler, inches	36	36	36	42	48	54	60	60	60	66
Length of Flues, feet.....	12	12	15	15	15	16	15	16	18	18
Numbers of Flues, (3 inch.).....	22	26	26	36	48	54	70	70	70	83
Height of Dome, inches.....	20	20	20	24	30	30	30	30	30	36
Diameter of Dome, inches.....	20	20	20	24	30	30	30	30	30	33
Diameter of Stack, inches.....	16	16	16	20	24	24	26	26	28	28
Length of Stack, feet.....	35	85	40	35	45	45	45	50	50	55
Weight of Boiler, about.....	2600	2800	3300	4400	6200	7100	7900	8400	9700	11500
Weight of Boiler fixtures, about.....	1800	1800	1900	2030	4800	4500	5200	5200	5200	6700
Weight of Boiler and fixtures, about..	4400	4600	5100	6450	10500	11600	13100	13600	14900	18200

221 CORTLANDT STREET, NEW YORK
FOR PRICES SEE ACCOMPANYING LIST.

HORIZONTAL TWO-FUUE BOILER.

COOKE & CO.

449

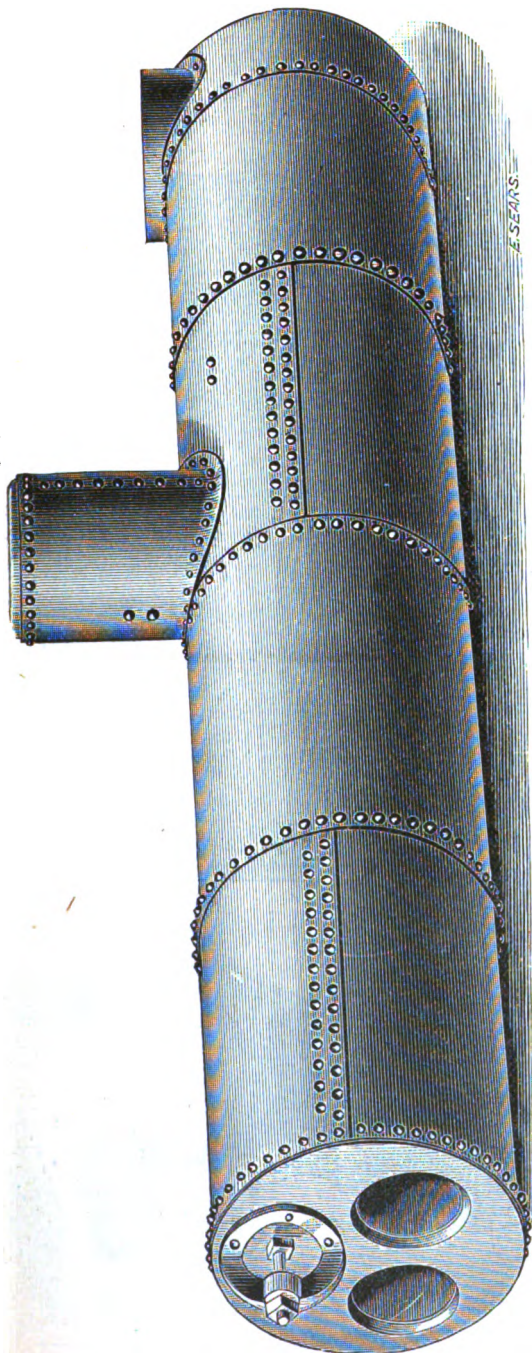


Fig. 1230

DIMENSIONS.

Number.	1	2	3	4	5
Horse Power.....	15	30	25	30	35
Diameter of Boiler, inches.....	36	40	42	44	46
Length of Flues, feet.....	15	18	14	15	16
Diameter of Flues, inches.....	12	13	10	11	12
Thickness of Shell, inches.....	No. 3	No. 3	No. 3	No. 3	5-16
Thickness of Flues, inches.....	No. 5	No. 3	No. 3	No. 3	5-16
Thickness of Heads, inches.....	1	1	1	1	1
Height of Dome, inches.....	24	22	24	24	26
Diameter of Dome, inches.....	20	20	22	22	24
Length of Stack, feet.....	40	40	33	33	33
Diameter of Stack, inches.....	18	20	20	20	24
Weight of Boiler and Brichen, about.....	3500	4700	5900	7300	9800
Weight of Boiler Fixtures, about.....	2000	9550	2700	3000	8500
Weight of Boiler and Fixtures, about.....	5500	7350	8300	10100	12800

22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

PORTABLE BOILER, CLASS A.

See Pages 451—453.

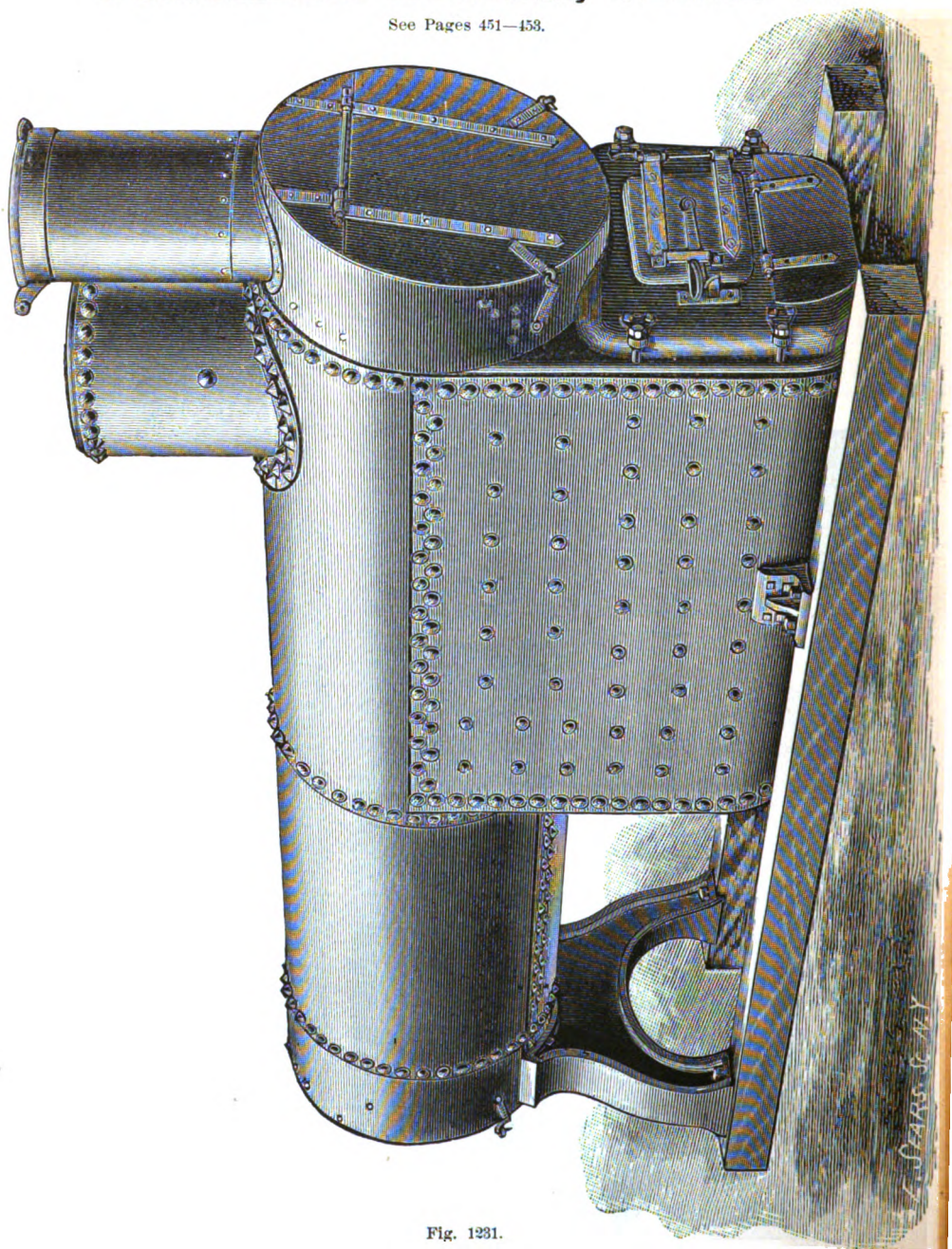


Fig. 1231.

22 CORTLANDT STREET, NEW YORK
FOR PRICES SEE ACCOMPANYING LIST.

PORTABLE BOILER, CLASS A. SECTIONAL VIEW.

See pages 450, 452 and 453.

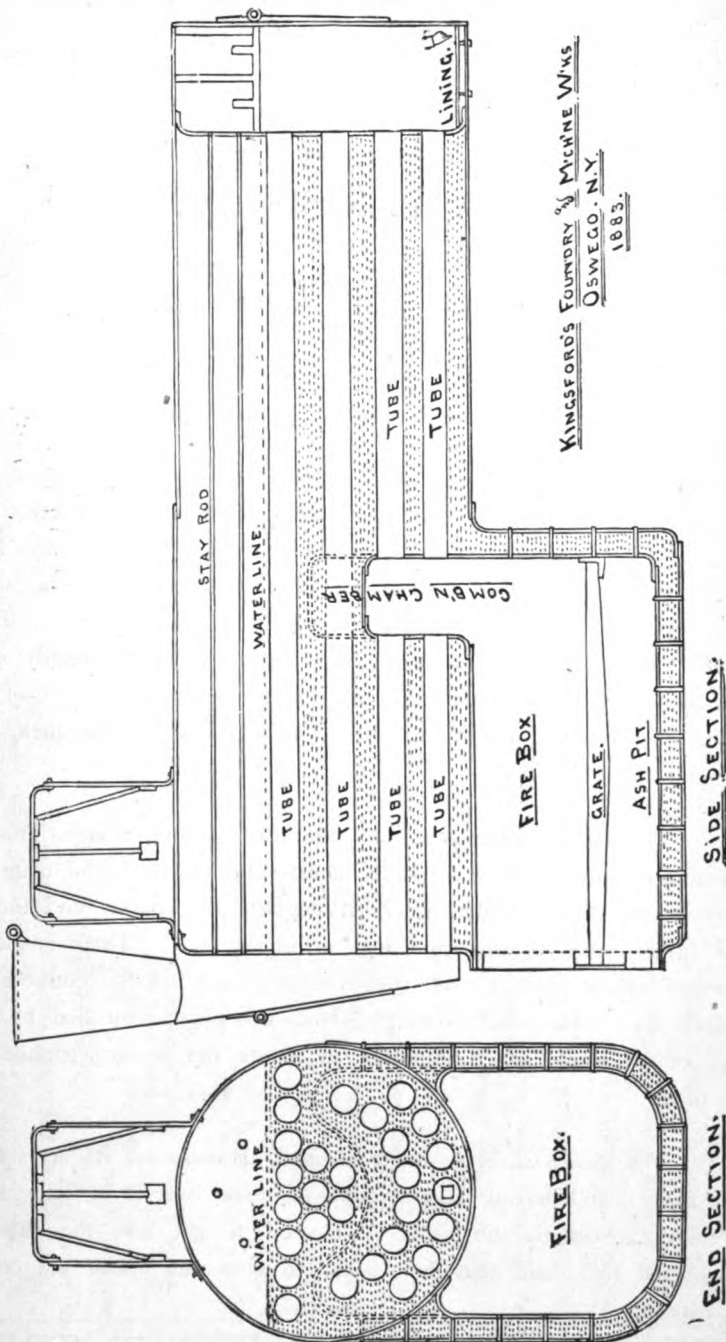


Fig. 1282.

22 HORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

PORTABLE BOILER.

CLASS A.

FIGS. 1231 and 1232.

(See Pages 450, 451 and 453.)

The boiler consists of a cylindrical shell throughout its entire length, and the fire-box and combustion chamber are merely additions to it which do not weaken the boiler. In the ordinary locomotive or portable boiler, the shell is an addition to the fire-box, which is a weak point in the construction of all locomotive boilers. The crown sheet being a flat surface and requiring to be very strongly stayed.—In our boiler we do away with the flat crown sheet, the bottom of the cylindrical shell forming the crown sheet; as it is part of the shell, it requires no staying.

The fire passes upward at the rear of the furnace into the combustion chamber and through the short tubes to the combustion chamber at the rear of the boiler, where it deposits the sparks, and then through the upper tubes to the front end or smoke box. There is also another row of tubes directly over the crown sheet, which connect with the smoke-box. The draft through these tubes is controlled by a damper and only enough fire is admitted to secure the heating surface contained in them.

The crown sheet is easily cleaned, as there are no stays to obstruct the same; and having several rows of tubes over it is well guarded; as, if from carelessness the water is allowed to get low, the tubes will be uncovered first, and they are liable to give out before the crown sheet is exposed.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Portable Boilers, Class "A."

FIGS. 1231 AND 1232. (SEE PAGES 450 TO 452.)

The Cut on page 450 represents one style of our Portable Boilers. A description of the construction will be found on page 452.

This Boiler was designed for us after several years of study and experiment, and is protected by both U. S. and Canadian patents.

It is as safe and as economical a boiler as can be made, and under practical use has proved itself far superior to any ordinary locomotive boiler.

It is a very quick steamer and very economical on fuel, and can be arranged to burn either coal, wood or straw.

DIMENSIONS OF PORTABLE BOILERS, CLASS "A."

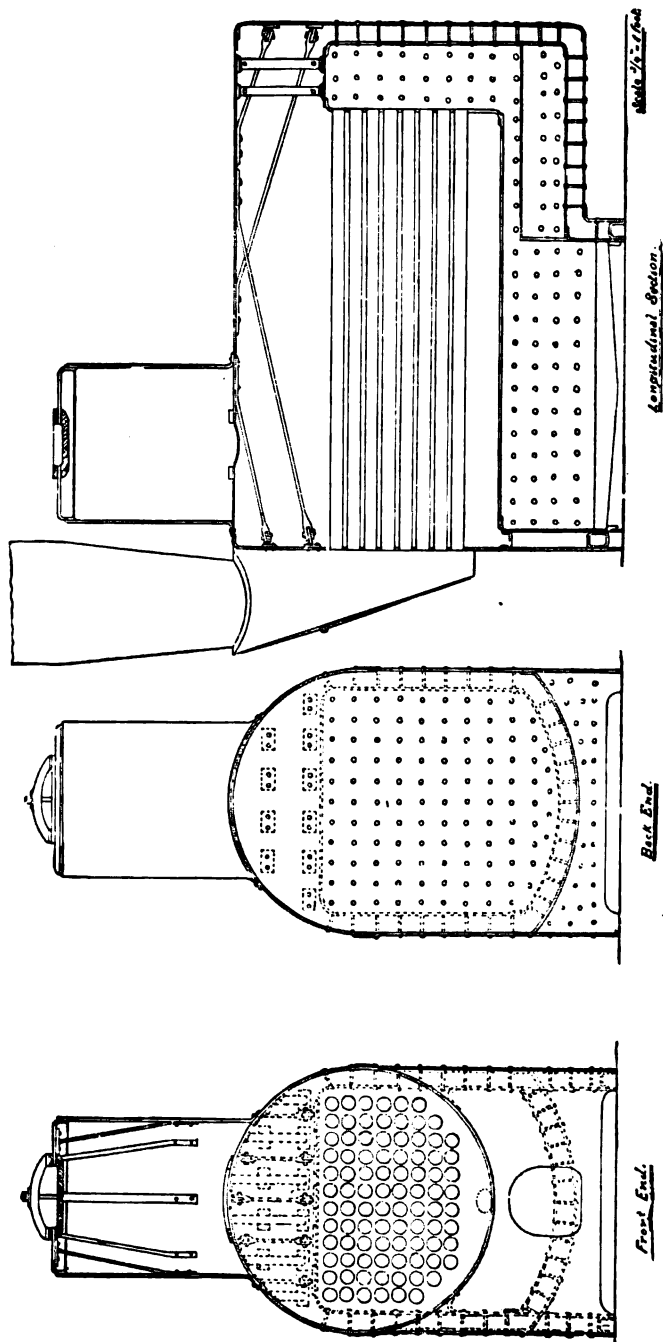
Horse Power.....	10	12	15	18	20	25	30	35	40	45
Diameter of Shell, inches.....	25	25	29	33	33	37	37	43	43	43
Length of Furnace (inside) inches.....	36	36	40	44	44	48	48	50	50	50
Width of Furnace (inside) inches.....	20	20	23	27	27	31	31	35	35	35
Height of Furnace (above grates) inches.....	12	12	15	16	16	18	18	20	20	20
Number of Direct Flues.....	14	14	13	14	14	17	17	27	27	27
Size of Direct Flues, inches.....	2	2	3	3	3	3	3	3	3	3
Length of Direct Flues, inches.....	84	102	96	102	114	108	138	108	120	132
Number of Return Flues.....	18	18	11	13	13	16	16	26	26	26
Size of Return Flues, inches.....	2	2	3	3	3	3	3	3	3	3
Length of Return Flues, inches.....	96	114	108	114	126	120	150	120	132	150
Heating Surface, square feet.....	126	147	133	221	246	290	356	443	485	548
										611

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

FITZGIBBON'S PATENT MARINE BOILER.—sectional view.

See page 455 and 456.



22 CORTLANDT STREET, NEW YORK.
FOR PRICES SEE ACCOMPANYING LIST.

FITZGIBBON'S PATENT MARINE BOILER.

FIG. 1233.

The cut on page 454 shows plainly the construction of these Boilers.

The Boiler consists of a cylindrical shell under which the fire box is attached. The outside sheet of fire box being riveted to the side of shell, and the inside sheet being rolled over and riveted to the under part of shell, thus allowing the under part of the shell to form the crown sheet of the furnace. This crown sheet being part of the cylindrical shell needs no staying, and does away with the network of crown bars and stays [usually found in fire box boilers. At the rear end of the boiler is a large combustion chamber connected with the furnace by a throat or chamber. This chamber, throat, and the furnace are all surrounded by water spaces, thus making them good heating surface. The tubes extend from the rear combustion chamber to the front of the boiler, and are above the crown sheet. This makes the Boiler less liable to damage from low water, as all the tubes would have to be uncovered before the crown sheet is bare.

Owing to the peculiar construction of this Boiler, we can put in a greater amount of heating surface than can be put in other Boilers occupying the same space.

The throat and combustion chamber being a continuation of the furnace, allows the gases to become ignited before passing into the small tubes, thus getting the best effect from the fuel.

The crown sheet, being unobstructed by stays and crown bars, is easily cleaned, which is an important point.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Fitzgibbon's Patent Marine Boiler.

FIG. 1233.

See Pages 454 and 455.

This boiler is designed for Marine purposes, and for use in other places where the space devoted to boiler room is limited.

Attention is invited to the novel construction of this boiler. The crown sheet is a part of the cylinder which forms the shell of the boiler and requires no staying. This does away with the net work of stays and crown bars usually over the crown sheet of a Fire-box Boiler, and avoids cutting away and weakening the crown sheet to insert the stays, allowing the construction of the strongest and most durable Fire-box Boiler in use. The entire furnace and combustion chamber is surrounded by a water space, thus giving the boiler ample furnace heating surface.

Attention is also invited to the large excess of heating surface in this style of boiler when compared with other boilers occupying the same amount of floor room.

We have manufactured this boiler for years, and it has proved itself, in practical use, to be a strong, durable, and most economical boiler; and as a quick generator has no equal.

These boilers are usually made to order, sizes being changed to accommodate them to the conditions under which they are to be used, but we give below a table of dimensions to enable you to compare the heating surface with other boilers occupying the same space.

TABLE OF DIMENSIONS.

Horse Power.....	22	22	24	30	36	42	44	55	72	85	95	115	130	155	185
Diameter.....Inches	38	40	42	46	50	54	57	60	64	68	68	76	80	90	96
Length.....Inches	78	78	84	90	102	108	114	120	132	132	144	144	144	144	144
Height to top of shell.....Inches	66	66	66	69	73	88	94	98	104	108	108	118	120	132	142
No. of Tubes.....	66	68	68	80	75	71	75	82	98	120	120	148	171	208	251
Size of Tubes.....Inches	2½	2½	2½	2½	2½	3	3	3	3	3	3	3	3	3	3
Length of Tubes.....	60	60	66	72	82	84	90	96	108	108	120	120	118	117	117
Heating Surface.....Sq Ft.	263	265	288	357	493	507	531	656	858	1079	1139	1382	1577	1875	2231

PORTABLE ENGINES AND BOILERS Mounted on Skids or on Wheels. (Particulars upon Application.)

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

KINGSFORD'S STATIONARY ENGINE.

PLAIN SLIDE VALVE.

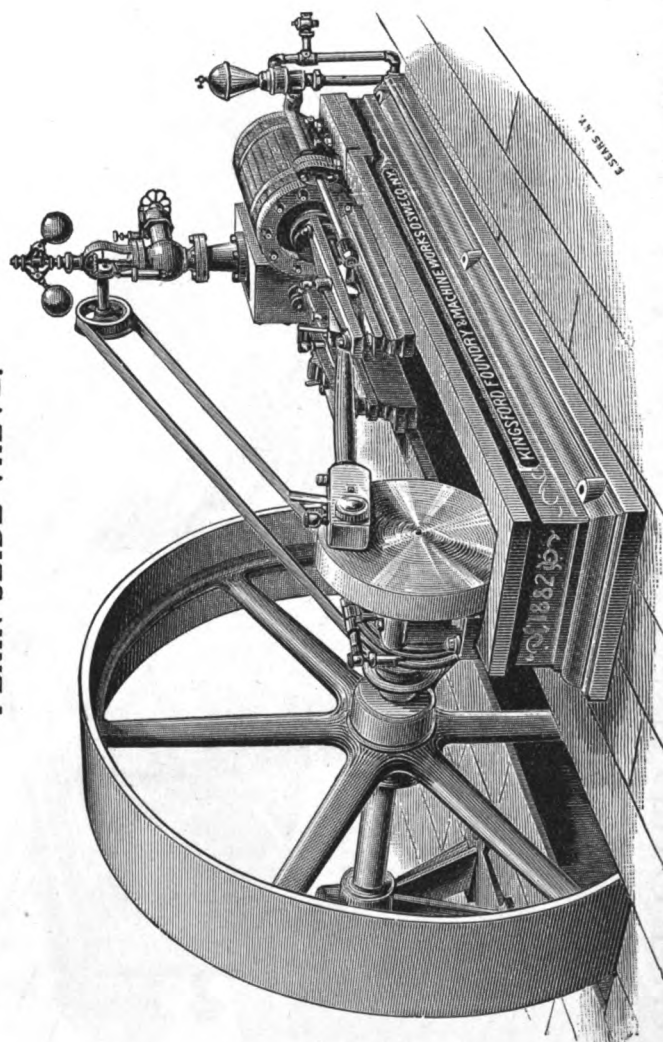
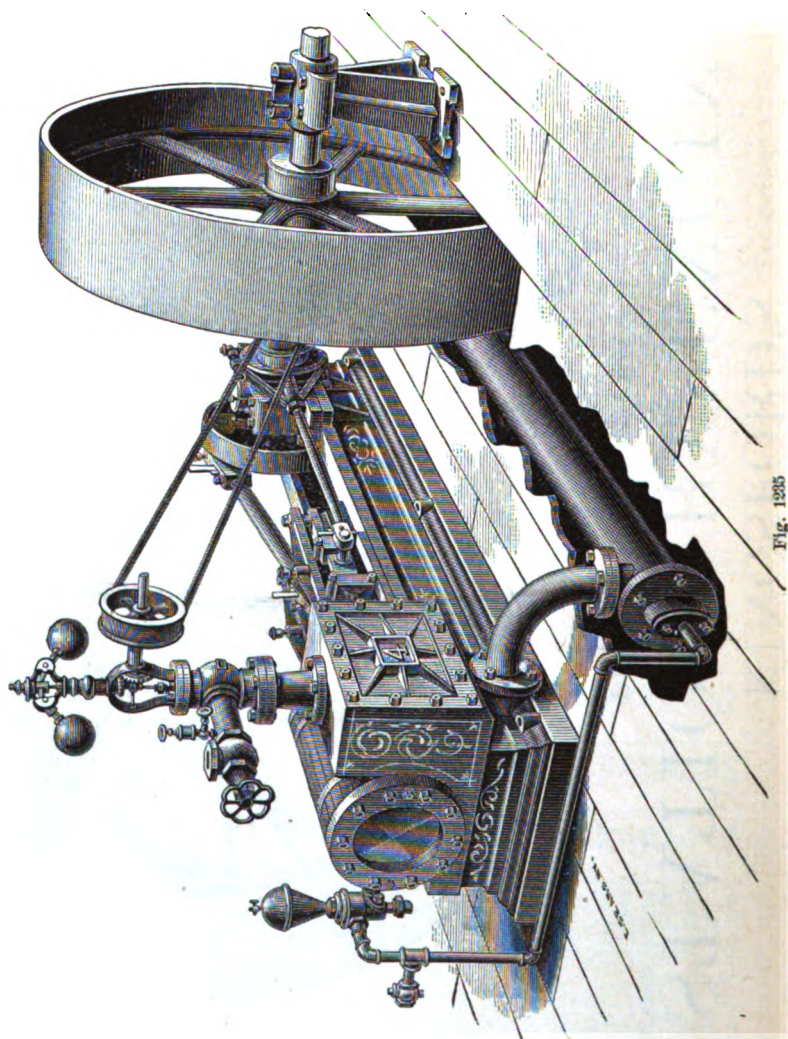


Fig. 1234.

22 CORTLANDT STREET, NEW YORK
FOR PRICES SEE ACCOMPANYING LIST.

KINGSFORD'S STATIONARY ENGINE.
PLAIN SLIDE VALVE.



22 CORTLANDT STREET, NEW YORK.
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The Kingsford Horizontal Engine with Variable Cut-off.

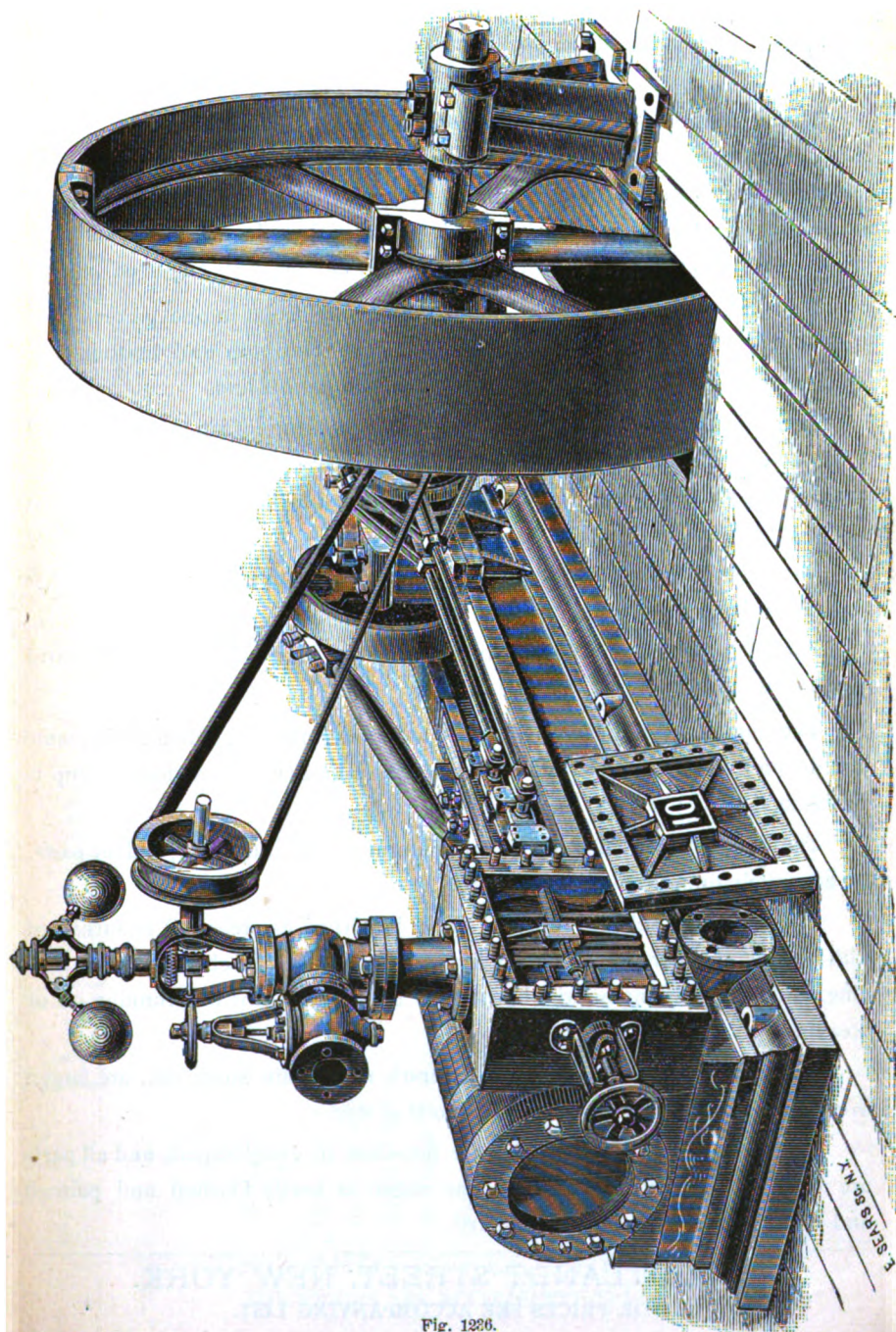


Fig. 1226.

DESCRIPTION OF Kingsford's Horizontal Engines.

The cuts on pages 457—459 represent our plain Side Valve and our Adjustable Cut-Off Engines. As will be seen by reference to Fig. 1236, the Adjustable Cut-Off arrangement on these engines is very simple, the Cut-Off valves being moved by a right and left screw, which is operated by a hand wheel. The arrangement is so simple that it can be operated by any ordinary engineer.

The bed or frame is made in box-shape, and is cast in one piece. It is very solid and heavy. It is accurately planed on both top and bottom, and therefore holds the cylinder guides and bearings in perfect line.

The cylinder and steam chest are cast in one piece, of an extra quality of iron, and are as hard as can be worked. The steam chest is on the side of cylinder, thus avoiding the use of the rock shaft and lever with their consequent lost motion.

In the smaller sizes the guides are of the locomotive pattern, but in the larger sizes have brass gibbs for taking up.

The pillow block is separate from the frame and is firmly doweled and bolted to it, and is adjustable to the bearing.

The pump, on engines of 10-inch cylinder and under, is bolted to the frame and driven from the cross-head. With larger engines an independent pump is furnished.

The valves, which affect the distribution of steam, and all dependent parts, are accurately proportioned and adjusted.

The governor (either "Judson's," or "Waters's," as preferred) is furnished with a spring speeder, by which the speed of engine may be changed while running, and by which engine will be stopped on the governor belt running off or breaking.

The connecting rod, valve and eccentric rods, main shaft, etc., are forged from the best refined iron; the crank pin is of steel.

All workmanship and material are first-class in every respect, and all parts are made to standard templates. The engine is neatly finished and painted and the cylinder is lagged with cherry.

22 CORTLANDT STREET, NEW YORK.

FOR PRICES SEE ACCOMPANYING LIST.

Dimensions of Stationary Engines.

Figs 1234—1236.

Number.....	3	4	5	6	7	8	9
Horse Power.....	15	25	40	50	75	90	110
Diameter of Cylinder..... inches	8	10	12	14	16	18	20
Length of Stroke..... inches	12	15	18	21	24	27	30
Number of Revolutions.....	150	140	120	100	95	80	70
Diameter of Steam Pipe..... inches	2	2½	3	3½	4	4½	5
Diameter of Exhaust Pipe..... inches	2½	3	3½	4½	5	5½	6
Diameter of Fly Wheel..... inches	60	72	96	96	96	108	120
Face of Fly Wheel..... inches	12	15	16	16	17	19	21
Diameter of Shaft..... inches	3½	3½	4½	6	6½	7	8
Length of Shaft..... feet	5	6	7	7	8	8	9
Weight.....	3500	6600	9600	13400	17900	24000	30000

The prices of Engines include governor and throttle valve, oil cups and drip cocks. The prices of pumps and heaters are given separately. Prices do not include exhaust or steam pipe, governor belts or foundation bolts and washers.

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FOR PRICES SEE ACCOMPANYING LIST.

CORLISS.—PATTERN ENGINE.

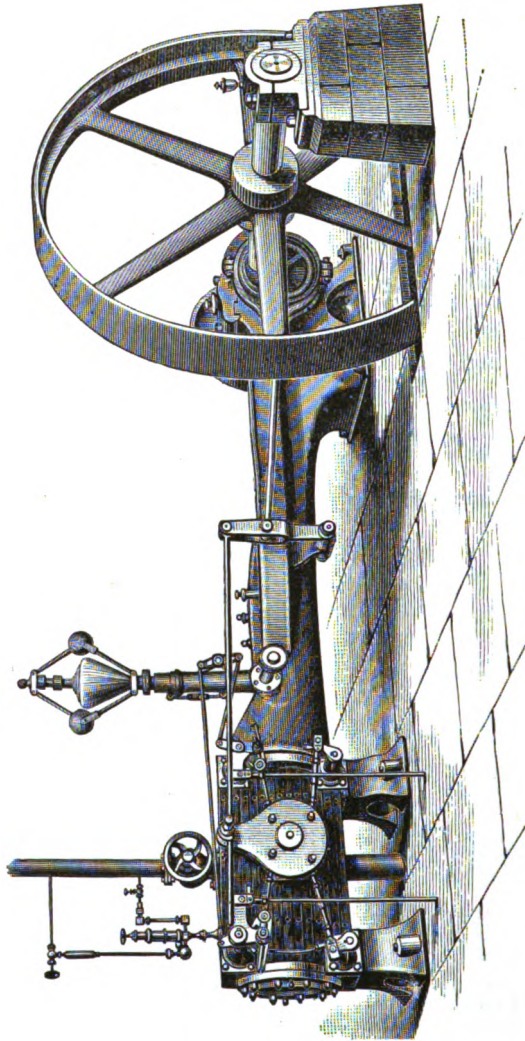


Fig. 1237.

The valve motion in these engines is of the latest improved Corliss type ; they are fitted with safety stop motion to prevent engine running away.

The peculiar features are the bed and crosshead ; the former, being very substantial, and the latter of the locomotive pattern, which is much superior to [that heretofore used on this class of engine.

They are made from 25 to 250 horse-power single, and to 500 horse-power double. Larger sizes to order.

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FOR PRICES SEE ACCOMPANYING LIST.

LOCOMOTIVES

FOR MINE SERVICE, WITHOUT STACK.

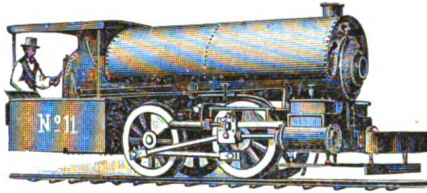


Fig. 1238.

Standard or narrow gauge.

FOR SWITCHING AND YARD SERVICE.

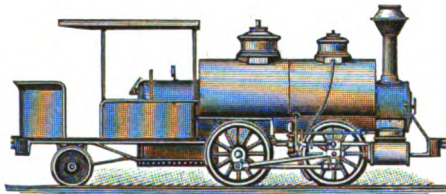


Fig. 1239.

Standard or narrow gauge.

FOR PASSENGER AND FREIGHT SERVICE.

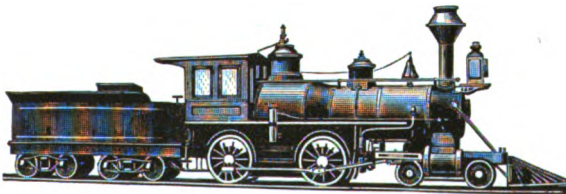


Fig. 1240.

Standard or narrow gauge.

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—AGENTS FOR—

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(FORMERLY DANFORTH LOCOMOTIVE & MACHINE CO.)

PATERSON, N. J., U. S. A.

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Adapted to Every Variety of Service.

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OVER 6000 CARDS OF THIS PATTERN NOW IN USE.

SAVING 40 PER CENT. IN POWER. BETTER QUALITY OF WORK.

SAVING ONE-HALF FLOOR SPACE. MORE DURABLE AND ECONOMICAL.

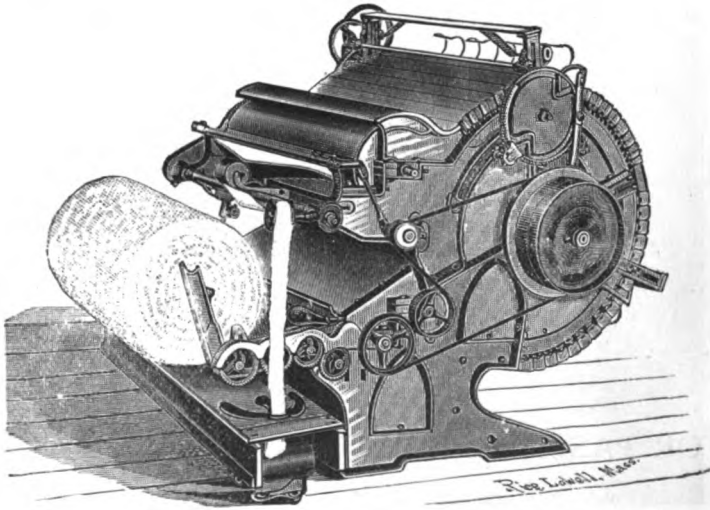


Fig. 1241.

This machine receives and delivers at one end. The cotton, after being fed through feed rolls, is passed through two lickers-in to main cylinder, and subjected to the action of seventeen under-flats, and freed of greater portion of leaf, all neps and dirt are effectually removed. It is then carried forward to seventeen top-flats to doffer, passing out above the lap to railway apron. The principal part of cleansing the cotton being done by the under-flats, it remains for the top-flats to serve the purpose of second carding, thereby finishing the process of straightening the fibre, the yarn from which is stronger and freer from leaf, neps or white knots than from any other card.

Manufacturers of most improved Ring and Traveller Cotton Spinning Frame. Also all kinds of Silk Machinery, etc.

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621

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